



**Hewlett Packard**  
Enterprise

# **HPE Distributed Index Handler**

Software Version: 11.3

## **Administration Guide**

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# Part I: Use the Distributed Index Handler

This section describes how to set up and use the HPE DIH.

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- [Operate the Distributed Index Handler](#)

# Chapter 1: Introduction

This chapter gives an overview of the HPE DIH.

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## About HPE DIH

The HPE Distributed Index Handler (HPE DIH) is a distribution server that distributes index actions to IDOL Servers. Distribution enables you to scale your system in a linear manner, increasing the speed of index actions and saving processing time. Distributing the index between multiple copies of IDOL Server can also ensure uninterrupted service if an IDOL Server fails.

The setup of your IDOL Servers is independent of the HPE DIH, because they are architecturally unaware of it.

The HPE DIH can index unstructured, semi-structured, or structured data into the connected IDOL Servers. You can aggregate this data from any type of repository by using HPE *Connectors*. Connectors import the data into IDX file format (unless the data is in XML format, which HPE IDOL Server also accepts) and passes it on to the HPE DIH.

In addition to indexing data into the connected IDOL Servers, the HPE DIH can also forward administrative index actions to its child IDOL Servers, for example to:

- activate IDOL Server configuration changes.
- delete content from IDOL Servers.
- create new IDOL Server databases.
- expire documents.
- compact IDOL Servers.
- change field values in IDOL Server documents.
- back up IDOL Servers.
- initialize IDOL Servers.
- validate the subindexes in an IDOL Server.

For details of all the index actions that the HPE DIH accepts, refer to the *Distributed Index Handler Reference*.

You can run the HPE DIH in either of two modes: *mirror mode* and *non-mirror mode*.

## OEM Certification

HPE Distributed Index Handler works in OEM licensed environments.



## System Architecture

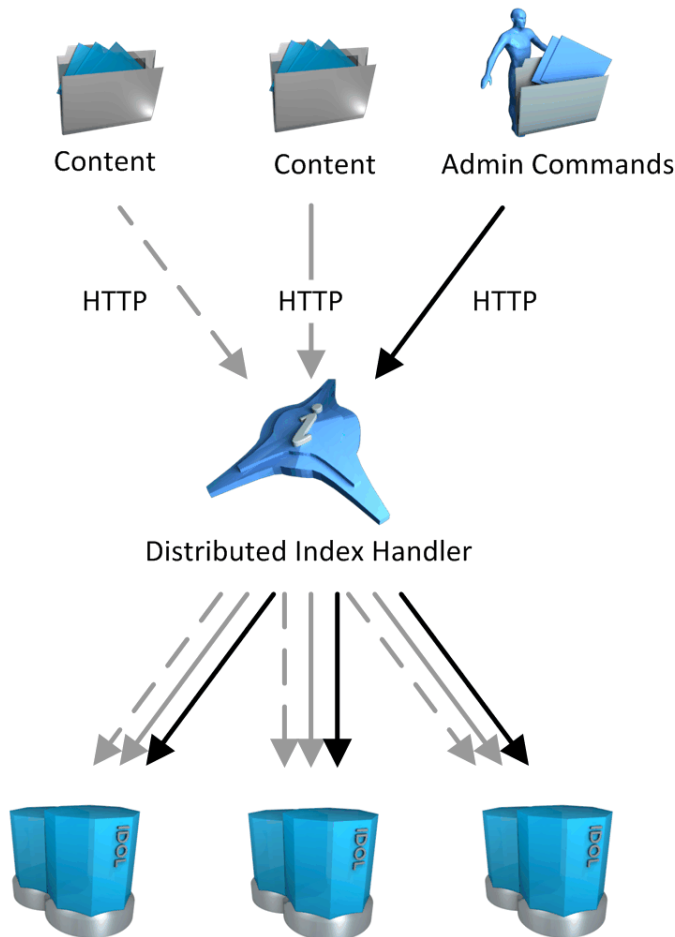
The HPE DIH receives index actions (data indexing requests or administrative actions) and distributes them to the connected IDOL servers.

### Mirror Mode

You determine the way that the HPE DIH distributes index data by using the `MirrorMode` parameter in the HPE DIH configuration file. In mirror mode (when you set `MirrorMode` to `True`), the HPE DIH indexes all data to all the connected IDOL servers. Each IDOL server is identical.

The diagram below shows how the HPE DIH in mirror mode integrates into an IDOL Server installation.

#### HPE DIH system architecture (mirror mode)



The HPE DIH sends all the index data that it receives (represented by gray arrows in the previous diagram) to all the connected IDOL Servers. The IDOL Servers are exact copies of each other, and must all have the same configuration.

You can run the HPE DIH in mirror mode to ensure uninterrupted service if one of the IDOL Servers fails. While one IDOL Server is inoperable, its identical copies continue to index data, and are still available to return data for queries.

The HPE DIH periodically checks whether all connected IDOL Servers are operating. If an IDOL Server is unavailable, the HPE DIH queues the data that this IDOL Server normally receives. When the IDOL Server is available again, the HPE DIH indexes the queued data into it.

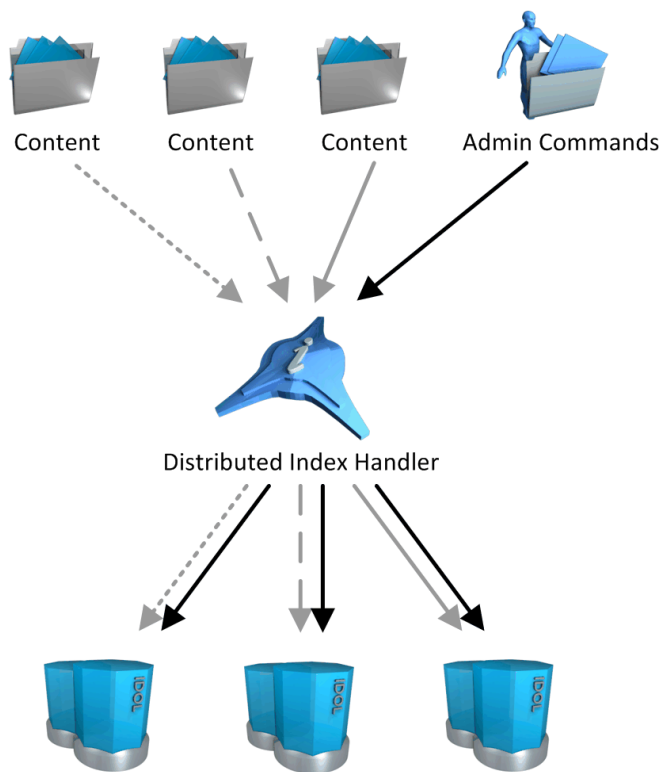
The HPE DIH sends administrative index actions (represented by black arrows in the previous diagram) to all connected IDOL Servers.

## Non-Mirror Mode

In non-mirror mode (when you set `MirrorMode` to `False`), the HPE DIH divides the index data among the connected IDOL servers. Each IDOL server receives the same amount of data.

The diagram below shows how the HPE DIH in non-mirror mode integrates into an IDOL server installation.

### HPE DIH system architecture (non-mirror mode)



The HPE DIH distributes the index data that it receives (represented by gray arrows in the diagram above) evenly across the connected IDOL Servers. For example, if the HPE DIH connects to four IDOL servers, it indexes approximately one quarter of the data into each IDOL server. It does not split up sections of individual documents.

Run the HPE DIH in non-mirror mode if the amount of data that you want to index is too large for a single IDOL Server. If the IDOL Servers that the HPE DIH indexes into are on different machines, the indexing process requires less time.

The HPE DIH periodically checks whether all the connected IDOL Servers are available. If an IDOL Server is unavailable, the HPE DIH queues the data that this IDOL Server normally receives. When the IDOL Server is available again, the HPE DIH indexes the queued data into it.

**NOTE:**

The `MirrorMode` parameter does not influence the behavior of administrative index actions. Even in non-mirror mode, the HPE DIH sends all administrative index actions to all the connected IDOL Servers.

**NOTE:**

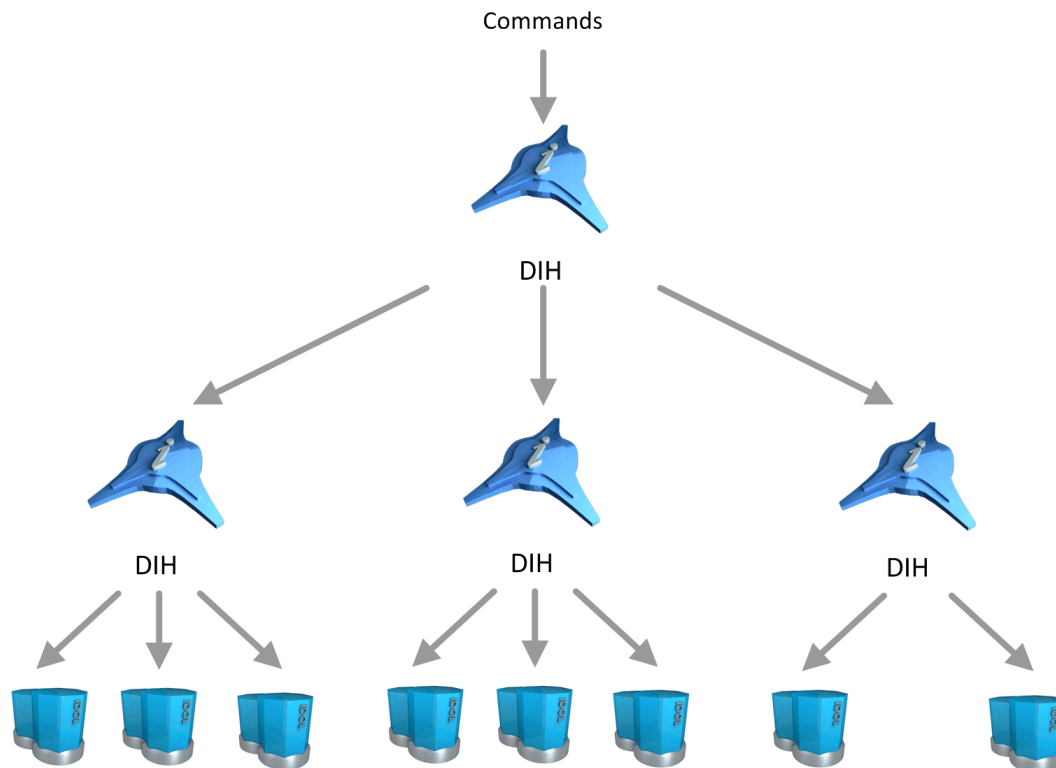
When you change the `MirrorMode` configuration option to enable or disable mirror mode, you must also delete the `Main/` subdirectory inside the HPE DIH installation directory.

This additional action prevents accidentally switching between mirror and non-mirror mode, which can cause a loss of data. If you do not delete the `Main/` directory when changing this option, HPE DIH does not start.

## Use Chained Distributed Index Handler Servers

You can set up multiple HPE DIH instances in a chained configuration. In this configuration, a parent HPE DIH distributes to child HPE DIH servers, which in turn distribute to child IDOL servers.

### HPE DIH system architecture (chained configuration)



In this configuration, the parent HPE DIH forwards all IDOL Server index actions to the child HPE DIH servers in the same way as to child IDOL Servers.

**NOTE:**  
Some index actions have different effects when sent to a child HPE DIH than when sent to an IDOL Server, because the HPE DIH forwards the action to multiple IDOL Servers.

Chaining provides an extra level of redundancy both at the HPE DIH level and at the IDOL Server level. It also distributes network traffic and system load over a larger number of computers. Use a chained HPE DIH server configuration to create a pool of IDOL Servers that are both fault-tolerant for maximum availability, and distributed for the best performance.

# Chapter 2: Install Distributed Index Handler

This section describes how to install the HPE DIH by using the IDOL Server installer.

**NOTE:**  
After you install the HPE DIH, you must configure at least two child IDOL servers to distribute to before you can use it.

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## System Requirements

This section describes the software and hardware requirements for IDOL and the HPE DIH.

## Supported Platforms

IDOL runs on a variety of Windows and UNIX platforms. For details of supported platforms, refer to the *IDOL Server 11.3 Release Notes*.

## Install HPE Distributed Index Handler on Windows

Use the following procedure to install HPE Distributed Index Handler on Microsoft Windows operating systems, by using the IDOL Server installer.

The IDOL Server installer provides the major IDOL components. It also includes License Server, which HPE Distributed Index Handler requires to run.

### To install HPE Distributed Index Handler

1. Double-click the appropriate installer package:

```
IDOLServer_VersionNumber_Platform.exe
```

where:

*VersionNumber* is the product version.

*Platform* is your software platform.


The Setup dialog box opens.

2. Click **Next**.

The License Agreement dialog box opens.

3. Read the license agreement. Select **I accept the agreement**, and then click **Next**.  
The Installation Directory dialog box opens.


4. Specify the directory to install HPE Distributed Index Handler (and optionally other components such as License Server) in. By default, the system installs on

C:\HewlettPackardEnterprise\IDOLServer-*VersionNumber*. Click  to choose another location. Click **Next**.

The Installation Mode dialog box opens.

5. Select **Custom**, and then click **Next**.

The License Server dialog box opens. Choose whether you have an existing License Server.

- To use an existing License Server, click **Yes**, and then click **Next**. Specify the host and ACI port of your License Server, and then click **Next**.
- To install a new instance of License Server, click **No**, and then click **Next**. Specify the ports that you want License Server to listen on, and then type the path or click  and navigate to the location of your HPE license key file (*licensekey.dat*), which you obtained when you purchased HPE Distributed Index Handler. Click **Next**.

The Component Selection dialog box opens.

6. Click **Next**.
7. Select the check boxes for the components that you want to install, and specify the port information for each component, or leave the fields blank to accept the default port settings.

For the DIH, you can specify the following ports:

<b>ACI Port</b>	The port that client machines use to send ACI actions to the DIH. Default: 9070
<b>Index Port</b>	The port that client machines use to send index actions to the DIH. Default: 9071
<b>Service Port</b>	The port that client machines use to send service requests to the DIH. Default: 9072

If you do not specify a value, the installer uses the specified default ports.

Click **Next** or **Back** to move between components.

8. After you have specified your settings, the Summary dialog box opens. Verify the settings you made and click **Next**.

The Ready to Install dialog box opens.

9. Click **Next**.

The Installing dialog box opens, indicating the progress of the installation. If you want to end the installation process, click **Cancel**.

10. After installation is complete, click **Finish** to close the installation wizard.

## Install an IDOL Component as a Service on Windows

On Microsoft Windows operating systems, you can install any IDOL component as a Windows service. Installing a component as a Windows service makes it easy to start and stop the component, and you can configure a component to start automatically when you start Windows.

Use the following procedure to install HPE Distributed Index Handler as a Windows service from a command line.

### To install a component as a Windows service

1. Open a command prompt with administrative privileges (right-click the icon and select **Run as administrator**).
2. Navigate to the directory that contains the component that you want to install as a service.
3. Send the following command:

```
Component.exe -install
```

where *Component.exe* is the executable file of the component that you want to install as a service.

The `-install` command has the following optional arguments:

<code>-start</code> {[auto]   [manual]   [disable]}	The startup mode for the component. <b>Auto</b> means that Windows services automatically starts the component. <b>Manual</b> means that you must start the service manually. <b>Disable</b> means that you cannot start the service. The default option is <b>Auto</b> .
<code>-username</code> <i>UserName</i>	The user name that the service runs under. By default, it uses a local system account.
<code>-password</code> <i>Password</i>	The password for the service user.
<code>-servicename</code> <i>ServiceName</i>	The name to use for the service. If your service name contains spaces, use quotation marks (") around the name. By default, it uses the executable name.
<code>-displayname</code> <i>DisplayName</i>	The name to display for the service in the Windows services manager. If your display name contains spaces, use quotation marks (") around the name. By default, it uses the service name.
<code>-depend</code> <i>Dependency1</i> [, <i>Dependency2</i> ...]	A comma-separated list of the names of Windows services that Windows must start before the new service. For example, if you are installing a Community component, you might want to add the Agentstore component and Content component as dependencies.

For example:

```
content.exe -install -servicename ContentComponent -displayname "IDOL Server Content Component" -depend LicenseServer
```

After you have installed the service, you can start and stop the service from the Windows Services manager.

When you no longer require a service, you can uninstall it again.

### To uninstall an IDOL Windows Service

1. Open a command prompt.
2. Navigate to the directory that contains the component service that you want to uninstall.
3. Send the following command:

```
Component.exe -uninstall
```

where *Component.exe* is the executable file of the component service that you want to uninstall.

If you did not use the default service name when you installed the component, you must also add the *-servicename* argument. For example:

```
Component.exe -uninstall -servicename ServiceName
```

## Install HPE Distributed Index Handler on UNIX

Use the following procedure to install HPE Distributed Index Handler in text mode on UNIX platforms.

### To install HPE Distributed Index Handler on UNIX

1. Open a terminal in the directory in which you have placed the installer, and enter the following command:

```
./IDOLServer_VersionNumber_Platform.exe --mode text
```

where:

*VersionNumber* is the product version

*Platform* is the name of your UNIX platform

#### NOTE:

Ensure that you have execute permission for the installer file.

The console installer starts and displays the Welcome screen.

2. Read the information and then press the `Enter` key.  
The license information is displayed.
3. Read the license information, pressing `Enter` to continue through the text. After you finish reading the text, type `y` to accept the license terms.
4. Type the path to the location where you want to install the servers, or press `Enter` to accept the default path.  
The Installation Mode screen is displayed.
5. Press `2` to select the Custom installation mode.  
The License Server screen opens. Choose whether you have an existing License Server.



- To use an existing License Server, type `y`. Specify the host and port details for your License Server (or press `Enter` to accept the defaults), and then press `Enter`. Go to Step 7.
  - To install a new instance of License Server, type `n`.
6. If you want to install a new License Server, provide information for the ports that the License Server uses.
    - a. Type the value for the ACI Port and press `Enter` (or press `Enter` to accept the default value).
 

**ACI Port** The port that client machines use to send ACI actions to the License Server.
    - b. Type the value for the Service Port and press `Enter` (or press `Enter` to accept the default value).
 

**Service Port** The port by which you send service actions to the License Server. This port must not be used by any other service.
    - c. Type the location of your HPE license key file (`licensekey.dat`), which you obtained when you purchased HPE Distributed Index Handler. Press `Enter`.
  7. The Component Selection screen is displayed. Press `Enter`. When prompted, type `y` for the components that you want to install. Specify the port information for each component, and then press `Enter`. Alternatively, leave the fields blank and press `Enter` to accept the default port settings.

For the DIH, you can specify the following ports:

<b>ACI Port</b>	The port that client machines use to send ACI actions to the DIH. Default: 9070
<b>Index Port</b>	The port that client machines use to send index actions to the DIH. Default: 9071
<b>Service Port</b>	The port that client machines use to send service requests to the DIH. Default: 9072

If you do not specify a value, the installer uses the specified default ports.

**NOTE:**  
These ports must not be used by any other service.

The Init Scripts screen is displayed.

8. Type the user that the server should run as, and then press `Enter`.

**NOTE:**  
The installer does not create this user. It must exist already.

9. Type the group that the server should run under, and then press `Enter`.

**NOTE:**  
If you do not want to generate init scripts for installed components, you can simply press `Enter` to move to the next stage of the installation process without specifying a user or group.

- The Summary screen is displayed.
10. Verify the settings that you made, then press `Enter` to begin installation.
 

The Installing screen is displayed.

This screen indicates the progress of the installation process.

The Installation Complete screen is displayed.
  11. Press `Enter` to finish the installation.

## Install an IDOL Component as a Service on Linux

On Linux operating systems, you can configure a component as a service to allow you to easily start and stop it. You can also configure the service to run when the machine boots. The following procedures describe how to install HPE Distributed Index Handler as a service on Linux.

### NOTE:

To use these procedures, you must have `root` permissions.

### NOTE:

When you install HPE Distributed Index Handler on Linux, the installer prompts you to supply a user name to use to run the server. The installer populates the init scripts, but it does not create the user in your system (the user must already exist).

The procedure that you must use depends on the operating system and boot system type.

- For Linux operating system versions that use `systemd` (including CentOS 7, and Ubuntu version 15.04 and later), see [Install a Component as a Service for a `systemd` Boot System, below](#).
- For Linux operating system versions that use System V, see [Install a Component as a Service for a System V Boot System, on the next page](#).

## Install a Component as a Service for a `systemd` Boot System

### NOTE:

If your setup has an externally mounted drive that HPE Distributed Index Handler uses, you might need to modify the init script. The installed init script contains examples for an NFS mount requirement.

### To install an IDOL component as a service

1. Run the appropriate command for your Linux operating system environment to copy the init scripts to your `init.d` directory.
  - Red Hat Enterprise Linux (and CentOS)
 

```
cp IDOLInstalLDir/scripts/init/systemd/componentname
/etc/systemd/system/componentname.service
```
  - Debian (including Ubuntu):

```
cp IDOLInstalLDir/scripts/init/systemd/componentname
/lib/systemd/system/componentname.service
```

where *componentname* is the name of the init script that you want to use, which is the name of the component executable (without the file extension).

For other Linux environments, refer to the operating system documentation.

2. Run the following commands to set the appropriate access, owner, and group permissions for the component:

- Red Hat Enterprise Linux (and CentOS)

```
chmod 755 /etc/systemd/system/componentname
chown root /etc/systemd/system/componentname
chgrp root /etc/systemd/system/componentname
```

- Debian (including Ubuntu):

```
chmod 755 /lib/systemd/system/componentname
chown root /lib/systemd/system/componentname
chgrp root /lib/systemd/system/componentname
```

where *componentname* is the name of the component executable that you want to run (without the file extension).

For other Linux environments, refer to the operating system documentation.

3. (Optional) If you want to start the component when the machine boots, run the following command:

```
systemctl enable componentname
```

## Install a Component as a Service for a System V Boot System

### To install an IDOL component as a service

1. Run the following command to copy the init scripts to your `init.d` directory.

```
cp IDOLInstalLDir/scripts/init/systemv/componentname /etc/init.d/
```

where *componentname* is the name of the init script that you want to use, which is the name of the component executable (without the file extension).

2. Run the following commands to set the appropriate access, owner, and group permissions for the component:

```
chmod 755 /etc/init.d/componentname
chown root /etc/init.d/componentname
chgrp root /etc/init.d/componentname
```

3. (Optional) If you want to start the component when the machine boots, run the appropriate command for your Linux operating system environment:

- Red Hat Enterprise Linux (and CentOS):

```
chkconfig --add componentname
chkconfig componentname on
```

- Debian (including Ubuntu):  
update-rc.d *componentname* defaults

For other Linux environments, refer to the operating system documentation.

## Chapter 3: Configure the Distributed Index Handler

The HPE DIH configuration file contains settings that determine how the HPE DIH operates. You can modify these settings to customize HPE DIH according to your requirements.

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### Edit the Configuration File

You configure the HPE DIH by modifying the HPE DIH configuration file. The configuration file, `dih.cfg`, is installed in the HPE DIH installation subdirectory:

```
installDir\dih\dih.cfg
```

where `installDir` is the directory in which the HPE DIH is installed.

### Unified Configuration

HPE DIH is generally installed and operated as a stand-alone component, where you use a separate `dih.cfg` file to configure the HPE DIH. However, in simple testing and training setups you can configure the HPE DIH as part of a unified IDOL Server, by using the `idolserver.cfg` file.

For more details about unified and component setups, refer to the *IDOL Getting Started Guide*.

In a unified configuration, use the `[DistributionSettings]` section of the `IDOLserver.cfg` file to enter configuration options that normally appear in the `[Server]` section of the `dih.cfg` file for a stand-alone configuration. All other section names are the same in both configuration files.

There are two ways in which to configure HPE DIH for a unified configuration:

- **Configure DAH and HPE DIH together.**
  - Use the `[DistributionSettings]` section of the `idolserver.cfg` file to set configuration options that normally appear in the `[Server]` section of the `dih.cfg` file for a stand-alone configuration.
  - Use the `[DistributionIDOLServers]` and `[IDOLServerN]` sections to configure the child servers. Refer to the *IDOL Server Administration Guide*.

In this type of configuration, all child servers perform both index and ACI actions, and the configuration options that you set apply to both DAH and HPE DIH. For this example, the child servers are stand-alone Content components.

- **Configure DAH and HPE DIH separately.**

- Use the [DistributionSettings] section of the `idolserver.cfg` file to set general HPE DIH configuration options.
- Use the [DAHEngines] and [DIHEngines] sections to configure DAH and HPE DIH child servers respectively. Refer to the *IDOL Server Administration Guide* and the *Distributed Action Handler Administration Guide*.

In this type of configuration, you can configure different child servers to perform indexing or ACI actions exclusively, which permits greater flexibility in administering your system. For example, the HPE DIH can distribute index actions to HPE DIH child servers in a chained distribution setup, while the DAH distributes actions directly to Content servers.

The configuration examples in this guide generally consider HPE DIH as a stand-alone component, with its own configuration file.

## Modify Configuration Parameter Values

You modify HPE Distributed Index Handler configuration parameters by directly editing the parameters in the configuration file. When you set configuration parameter values, you must use UTF-8.

### CAUTION:

You must stop and restart HPE Distributed Index Handler for new configuration settings to take effect.

This section describes how to enter parameter values in the configuration file.

### Enter Boolean Values

The following settings for Boolean parameters are interchangeable:

TRUE = true = ON = on = Y = y = 1

FALSE = false = OFF = off = N = n = 0

### Enter String Values

To enter a comma-separated list of strings when one of the strings contains a comma, you can indicate the start and the end of the string with quotation marks, for example:

```
ParameterName=cat,dog,bird,"wing,beak",turtle
```

Alternatively, you can escape the comma with a backslash:

```
ParameterName=cat,dog,bird,wing\,beak,turtle
```

If any string in a comma-separated list contains quotation marks, you must put this string into quotation marks and escape each quotation mark in the string by inserting a backslash before it. For example:

```
ParameterName="<font face=\"arial\" size=\"+1\"><b>,<p>
```

Here, quotation marks indicate the beginning and end of the string. All quotation marks that are contained in the string are escaped.

## Include an External Configuration File

You can share configuration sections or parameters between ACI server configuration files. The following sections describe different ways to include content from an external configuration file.

You can include a configuration file in its entirety, specified configuration sections, or a single parameter.

When you include content from an external configuration file, the `GetConfig` and `ValidateConfig` actions operate on the combined configuration, after any external content is merged in.

In the procedures in the following sections, you can specify external configuration file locations by using absolute paths, relative paths, and network locations. For example:

```
../sharedconfig.cfg
K:\sharedconfig\sharedsettings.cfg
\\example.com\shared\idol.cfg
file://example.com/shared/idol.cfg
```

Relative paths are relative to the primary configuration file.

### NOTE:

You can use nested inclusions, for example, you can refer to a shared configuration file that references a third file. However, the external configuration files must not refer back to your original configuration file. These circular references result in an error, and HPE Distributed Index Handler does not start.

Similarly, you cannot use any of these methods to refer to a different section in your primary configuration file.

## Include the Whole External Configuration File

This method allows you to import the whole external configuration file at a specified point in your configuration file.

### To include the whole external configuration file

1. Open your configuration file in a text editor.
2. Find the place in the configuration file where you want to add the external configuration file.
3. On a new line, type a left angle bracket (<), followed by the path to and name of the external configuration file, in quotation marks (""). You can use relative paths and network locations. For example:

```
< "K:\sharedconfig\sharedsettings.cfg"
```

4. Save and close the configuration file.

## Include Sections of an External Configuration File

This method allows you to import one or more configuration sections from an external configuration file at a specified point in your configuration file. You can include a whole configuration section in this way, but the configuration section name in the external file must exactly match what you want to use in your file. If you want to use a configuration section from the external file with a different name, see [Merge a Section from an External Configuration File, on the next page](#).

### To include sections of an external configuration file

1. Open your configuration file in a text editor.
2. Find the place in the configuration file where you want to add the external configuration file section.
3. On a new line, type a left angle bracket (<), followed by the path to and name of the external configuration file, in quotation marks (""). You can use relative paths and network locations. After the configuration file name, add the configuration section name that you want to include. For example:

```
< "K:\sharedconfig\extrasettings.cfg" [License]
```

**NOTE:**

You cannot include a section that already exists in your configuration file.

4. Save and close the configuration file.

## Include a Parameter from an External Configuration File

This method allows you to import a parameter from an external configuration file at a specified point in your configuration file. You can include a section or a single parameter in this way, but the value in the external file must exactly match what you want to use in your file.

### To include a parameter from an external configuration file

1. Open your configuration file in a text editor.
2. Find the place in the configuration file where you want to add the parameter from the external configuration file.
3. On a new line, type a left angle bracket (<), followed by the path to and name of the external configuration file, in quotation marks (""). You can use relative paths and network locations. After the configuration file name, add the name of the configuration section name that contains the parameter, followed by the parameter name. For example:

```
< "license.cfg" [License] LicenseServerHost
```

To specify a default value for the parameter, in case it does not exist in the external configuration file, specify the configuration section, parameter name, and then an equals sign (=) followed by the default value. For example:

```
< "license.cfg" [License] LicenseServerHost=localhost
```

4. Save and close the configuration file.



## Merge a Section from an External Configuration File

This method allows you to include a configuration section from an external configuration file as part of your HPE Distributed Index Handler configuration file. For example, you might want to specify a standard SSL configuration section in an external file and share it between several servers. You can use this method if the configuration section that you want to import has a different name to the one you want to use.

### To merge a configuration section from an external configuration file

1. Open your configuration file in a text editor.
2. Find or create the configuration section that you want to include from an external file. For example:

```
[SSLOptions1]
```

3. After the configuration section name, type a left angle bracket (<), followed by the path to and name of the external configuration file, in quotation marks (""). You can use relative paths and network locations. For example:

```
[SSLOptions1] < "../sharedconfig/ssloptions.cfg"
```

If the configuration section name in the external configuration file does not match the name that you want to use in your configuration file, specify the section to import after the configuration file name. For example:

```
[SSLOptions1] < "../sharedconfig/ssloptions.cfg" [SharedSSLOptions]
```

In this example, HPE Distributed Index Handler uses the values in the [SharedSSLOptions] section of the external configuration file as the values in the [SSLOptions1] section of the HPE Distributed Index Handler configuration file.

#### NOTE:

You can include additional configuration parameters in the section in your file. If these parameters also exist in the imported external configuration file, HPE Distributed Index Handler uses the values in the local configuration file. For example:

```
[SSLOptions1] < "ssloptions.cfg" [SharedSSLOptions]
SSLCACertificatesPath=C:\IDOL\HTTPConnector\CACERTS\
```

4. Save and close the configuration file.

## The DIH Configuration File

By default, the HPE DIH configuration file is named `dih.cfg`, and it is stored in your HPE DIH installation directory:

```
InstallDir\dih\dih.cfg
```

where *InstallDir* is the directory in which you have installed IDOL components.

## Display the Online Reference

The HPE DIH Reference contains information about all available configuration parameters and actions, including index actions.

To view the HPE DIH Reference, start the HPE DIH and send the following action from your Web browser:

```
http://DIHhost:ACIPort/action=Help
```

For HPE DIH to display help, the help data file (help.dat) must be available in the same directory as the service instance.

The Reference lists the configuration file sections that you can use each parameter in, under the heading **Configuration Parameters**.

## Configuration File Sections

The HPE DIH configuration file contains several sections that represent different areas that you can configure. For details on all available configuration parameters, refer to the *Distributed Index Handler Reference* (see [Display the Online Reference](#), above).

### [ACIEncryption]

You can use the [ACIEncryption] section to encrypt communications between ACI servers and any applications that use the HPE ACI API. For example:

```
[ACIEncryption]
CommsEncryptionType=GSS
ServiceName=Kerberos
```

### [DistributionIDOLServers] Section

The [DistributionIDOLServers] section contains settings that determine the location of the IDOL Servers that the HPE DIH communicates with, and the ports by which this communication takes place. There is a separate [IDOLServerN] subsection for each child server. The child servers can be IDOL Servers, Content components, or child HPE DIH servers.

If you use date-based indexing, you must also configure [DateRangeN] subsections to specify the date ranges that each child server indexes.

For example:

```
[DistributionIDOLServers]
Number=2
```

```
[IDOLServer0]
Host=emerson
Port=5502
```

```
[IDOLServer1]
```

```
Host=thoreau
Port=5602
```

For non-mirrored systems, you can also create child server groups by specifying more than one child server in a comma-separated list. Each child in the group receives the same data from the parent HPE DIH. For example:

```
[DistributionIDOLServers]
Number=2
```

```
[IDOLServer0]
Host=DIH1.company.com,DIH2.company.com
Port=5502,5702
```

```
[IDOLServer1]
Host=DIH3.company.com
Port=5602
```

In this example, the HPE DIH distributes data between the three HPE DIH child servers. DIH1 and DIH2 receive the same data (they are mirrored copies of each other), and DIH3 receives a different set of data. The child servers can then distribute data between their respective child servers.

**NOTE:**

If you configure DAH and DIH together in the IDOL Server configuration file, DAH can use the child server groups. However, you cannot also configure virtual databases in the DAH. Refer to the *Distributed Action Handler Administration Guide*.

## [IndexNotify] Section

The [IndexNotify] section contains parameters that control and enable the automatic generation of index job information for a specified host. For example:

```
[IndexNotify]
Host=10.1.1.10
ACIPort=9992
BatchSize=1
BatchTimeout=10000
ConnectRetries=1
ConnectTimeout=5000
```

## [IndexQueue] Section

The [IndexQueue] section contains parameters that control the index queue. For example:

```
[IndexQueue]
IndexQueueInitialSize=30000
IndexQueueMaxHistory=4000
IndexQueueMaxPendingItems=100
```

## [License] Section

The [License] section contains licensing details, which you must not change. For example:

```
[License]
Holder=My Company
Key=01234567890
Operations=803|87sdhsdf9n94nmsf7oasda987w4yriasunfaasd
```

## [Logging] Section

The [Logging] section lists the logging streams that you set up to create separate log files for different log message types (query, index, and application). It contains a section for each of the listed logging streams, in which you configure the settings that determine how to log each stream. For example:

```
[Logging]
0=INDEX_LOG_STREAM
1=QUERY_LOG_STREAM
2=APP_LOG_STREAM

[INDEX_LOG_STREAM]
LogFile=index.log
LogDirectory=./logs/DIHIndexLogs
LogHistorySize=55
LogTime=True
LogEcho=True
LogMaxSizeKbs=1024
LogTypeCSVs=index
LogLevel=full
LogExpireAction=timestamp

[QUERY_LOG_STREAM]
LogFile=query.log
LogDirectory=./logs/DIHQueryLogs
LogHistorySize=50
LogTime=True
LogEcho=True
LogMaxSizeKbs=1024
LogTypeCSVs=query
LogLevel=full
LogExpireAction=consecutive

[APP_LOG_STREAM]
LogFile=application.log
LogDirectory=./logs/DIHAppLogs
LogHistorySize=50
LogTime=True
LogEcho=True
LogMaxSizeKbs=1024
```

```
LogTypeCSVs=application
LogLevel=full
LogExpireAction=datestamp
```

**NOTE:**

The query logs truncate all queries to 4,000 characters.

**[Paths] Section**

The [Paths] section contains settings that determine where to store index data and other files. For example:

```
[Paths]
Main=./main
Incoming=./incoming
Archive=./archive
Failed=./failedTasks
```

**[RoundRobinMode] Section**

The [RoundRobinMode] section contains settings that control data indexing when you use round robin mode. Use settings in [DAHServerN] sections to configure the child servers for powerup and shutdown when round robin data indexing rollover occurs. For example:

```
[RoundRobinMode]
ServerImmediateStart=2
NextServerStartTime=00:00
NextServerStartDate=2006/10/20
PeriodInSec=86400
RoundRobinMode=True
```

```
[DAHServer0]
Host=host1
Port=12000
ShutDownEnginePeriods=0,-1
```

```
[DAHServer1]
Host=host2
Port=13000
StartUpEnginePeriods=-2
```

**[Server] Section**

The [Server] section contains general settings for indexing. For example:

```
[Server]
QueryClients=*. *.*.*.*
IndexClients=*. *.*.*.*
AdminClients=*. *.*.*.*
```

```

DIHPort=9001
Port=9002
MirrorMode=True
ArchiveMode=True
ArchiveFailedTasks=True

```

## [Service] Section

The [Service] section contains settings that determine which machines have permission to use and control the HPE DIH service. For example:

```

[Service]
ServicePort=40010
ServiceControlClients=127.0.0.1
ServiceStatusClients=127.0.0.1

```

## [SSLOptionM] Section

The [SSLOptionM] section contains settings that determine incoming or outgoing SSL connections between the HPE DIH and other servers.

For example:

```

[SSLOption0]
SSLMethod=TLSV1.2
SSLCertificate=host1.crt
SSLPrivateKey=host1.key

[SSLOption1]
SSLMethod=TLSV1.2
SSLCertificate=host2.crt
SSLPrivateKey=host2.key
SSLPrivateKeyPassword=sample1XQ
SSLCheckCommonName=True

```

### NOTE:

You must create an SSLOption section for each unique value set by the SSLConfig parameter in the [IDOLServerN] section, or the [DIHEngineN] section.

## Example Configuration File

```

[Service]
ServicePort=16002
ServiceControlClients=*. *.*.*
ServiceStatusClients=*. *.*.*

[Server]
Port=16000
DIHPort=16001

```

```
MirrorMode=True
```

```
[DistributionIDOLServers]  
Number=2
```

```
[IDOLServer0]  
Host=localhost  
Port=5502
```

```
[IDOLServer1]  
Host=localhost  
Port=5602
```

```
[Logging]  
0=INDEX_LOG_STREAM  
1=QUERY_LOG_STREAM  
2=APP_LOG_STREAM
```

```
[INDEX_LOG_STREAM]  
LogFile=index.log  
LogTypeCSVs=index  
LogHistorySize=50  
LogTime=True  
LogEcho=True  
LogMaxSizeKbs=1024  
LogExpireAction=timestamp
```

```
[QUERY_LOG_STREAM]  
LogFile=query.log  
LogTypeCSVs=query  
LogEcho=True
```

```
[APP_LOG_STREAM]  
LogFile=application.log  
LogTypeCSVs=application  
LogEcho=True
```

```
[Paths]  
IncomingPath=./incoming  
LogPath=./logs
```

## Manage Child Servers

This section describes how to add and remove child IDOL servers and distribute data.

## Add an IDOL Server to the Distributed Index Handler

After you install the HPE DIH, you can add more IDOL servers that the HPE DIH can distribute actions to.

### *To add an IDOL server to the HPE DIH*

1. Open the HPE DIH configuration file in a text editor.
2. Find the [DistributionIDOLServers] section.
3. Increase the value of the Number parameter by one, and add an [IDOLServerN] subsection for the new IDOL Server. The value of *N* must be one fewer than the value of the Number setting.

For example, if the following configuration is the original [DistributionIDOLServers] section:

```
[DistributionIDOLServers]
Number=2
```

```
[IDOLServer0]
Host=emerson
Port=5502
```

```
[IDOLServer1]
Host=thoreau
Port=5602
```

This section defines two IDOL servers. To add a third IDOL server, make the following changes:

- Increase Number to 3.
- Add an [IDOLServer2] for your new server.

For example:

```
[DistributionIDOLServers]
Number=3
```

```
[IDOLServer0]
Host=emerson
Port=5502
```

```
[IDOLServer1]
Host=thoreau
Port=5602
```

```
[IDOLServer2]
Host=jefferson
Port=5502
```

4. Save and close the configuration file. Restart the HPE DIH for your changes to take effect.



## Remove an IDOL Server from the Distributed Index Handler

You can remove an IDOL server from the list of servers to which the HPE DIH can distribute actions.

### **To remove an IDOL server from the HPE DIH**

1. Open the HPE DIH configuration file in a text editor.
2. Find the [DistributionIDOLServers] section.
3. Decrease the value of the Number setting by one, and delete the subsection for the IDOL server to remove. Then, if necessary, renumber the individual subsections to restore a consecutive increasing sequence for *N*.

For example, if the following configuration is your current [DistributionIDOLServers] section:

```
[DistributionIDOLServers]
Number=3
```

```
[IDOLServer0]
Host=emerson
Port=5502
```

```
[IDOLServer1]
Host=thoreau
Port=5602
```

```
[IDOLServer2]
Host=jefferson
Port=5502
```

This section defines three IDOL servers. To remove the second IDOL server, make the following changes:

- Decrease Number to 2.
- Remove the [IDOLServer1] subsection.
- Rename the [IDOLServer2] subsection to [IDOLServer1] to preserve the numbering sequence.

For example:

```
[DistributionIDOLServers]
Number=2
```

```
[IDOLServer0]
Host=emerson
Port=5502
```

```
[IDOLServer1]
```

```
Host=jefferson
Port=5502
```

4. Save and close the configuration file. Restart the HPE DIH for your changes to take effect.

## Add, Update, and Remove Child Servers Dynamically

You can add, edit, and remove child servers by using the `EngineManagement` action. This action updates the DIH configuration file, so that the changes are persistent.

For more details about the `EngineManagement` action, refer to the *DIH Reference*.

### Add a Child Server Dynamically

You can add a new child server to the DIH by using the `EngineManagement` action.

**NOTE:**

You can add a child server only in certain distribution modes.

#### To add a child server

- Send the `EngineManagement` action, with `EngineAction` set to `Add`. Set `Host` and `Port` to the host name and port of the child server.

You can optionally also set other parameters for the child server, such as `Disabled`, `Weight`, `UpdateOnly`, and `Polling`.

**TIP:**

By default, when you add a child server in this way, the DIH pings the specified host and port. The `Add` action fails if the child server is not running. Set `Disabled` to `True` to skip this step and add the child server in the offline state.

### Remove a Child Server Dynamically

In *consistent hashing* mode, you can remove a child server or group. For more information about this mode, see [Use Consistent Hashing, on page 46](#).

To remove a child server in this mode, you must first set `Weight` to 0 (zero), and then use the `DREREDISTRIBUTE` index action to redistribute the virtual nodes. For more information, see [Remove a Child Server, on page 50](#).

### Update a Child Server Dynamically

You can use the `EngineManagement` action to dynamically change the settings for a child server.

#### To update a child server

- Send the `EngineManagement` action, with `EngineAction` set to `Edit`. Set the `ID` parameter to the ID of the child server that you want to modify.

Set any of the optional parameters that you want to change for the child server, such as `Disabled`, `Weight`, `UpdateOnly`, and `Polling`.

## Determine the State of Child Servers

The HPE DIH regularly pings all its child IDOL servers to determine their state; running (up) or not running (down). In mirror mode, if a server is down, the HPE DIH queues the data for that server, and indexes the data into the server when it is available again. In non-mirror mode, the HPE DIH redistributes the data among the available servers. In this case, it also queues any updates to documents that have already been indexed, and sends the updates when the server is available again.

You can configure how often the HPE DIH checks the state of its child servers. Set the `PingInterval` parameter in the `[Server]` section of the HPE DIH configuration file to the time interval between checks. The default value is 20 seconds.

## Distribute Data Dynamically across Child Servers

In non-mirror mode, you can configure the HPE DIH to distribute data dynamically across a bank of child servers, based on user-defined limits to the number of documents. This option also allows you to determine when all child servers are full and you require new machines.

To define a maximum for document indexing into child servers, set the `MaxDocumentCount` parameter for each child IDOL Server, in the `[Server]` section of the IDOL server configuration file. You can also use the `MaxDocumentCountUpper` and `MaxDocumentCountLower` parameters for more control over the document limits. Refer to the *IDOL Server Reference* for details on these configuration options.

When an IDOL Server reaches the maximum number of documents, it returns `<FULL>` in the `GetStatus` action response. IDOL servers also return a `<FULL_RATIO>` tag, to indicate how close the index is to being full.

Use the following configuration parameters to specify how the HPE DIH deals with full child servers.

<code>CollectChildFullness</code>	Whether to send a <code>GetStatus</code> action to child servers to determine if they are full.  The HPE DIH then also returns its own fullness information in the response to a <code>GetStatus</code> action. If the HPE DIH has no information from its child servers (for example, when you set <code>CollectChildFullness</code> to <code>False</code> ), the HPE DIH reports that it is not full.
<code>GetChildStatusMode</code>	How often to send <code>GetStatus</code> actions to the child servers.  If you set <code>GetChildStatusMode</code> to <code>Command</code> , the HPE DIH sends a <code>GetStatus</code> action with every index action. If you set <code>GetChildStatusMode</code> to <code>ASync</code> , the HPE DIH sends a <code>GetStatus</code> action after every <code>PingInterval</code> .
<code>PingInterval</code>	How often to send <code>GetStatus</code> actions, if you set <code>GetChildStatusMode</code> to <code>ASync</code> .
<code>RespectChildFullness</code>	Whether to index into full child servers. If you set this parameter to <code>True</code> , the HPE DIH routes actions to child servers that are not full.  This implicitly sets <code>CollectChildFullness</code> to <code>True</code> .

RespectChildFullness	The maximum number of child server groups to use for indexing.
MaxIndexingGroups	When you set this parameter, HPE DIH indexes into only the first <i>N</i> non-full child server groups in your configuration. When a child server group becomes full, indexing rolls over to the next non-full child server group.

If all child servers return <FULL>, you must either add more machines to your system, or create space on the existing machines.

For more information about these configuration parameters, refer to the *DIH Reference*.

### Related Topics

- [Use Chained Distributed Index Handler Servers, on page 11](#)

## Designate a Child Server as an Archive Server

In non-mirror mode, you can designate a child server as an archive server. An archive server receives document updates but does not receive new documents.

Set the `UpdateOnly` parameter to `True` in the `[DistributionIDOLServers]` section of the HPE DIH configuration file to convert a child server into an archive server.

### NOTE:

You cannot use the `UpdateOnly` option with the `DistributeByFields`, `DistributeByReference`, or `RoundRobinMode` distribution modes. For more information about the compatible options for distribution modes, refer to *IDOL Expert*.

### NOTE:

If all children are marked as `UpdateOnly`, the DIH cannot process any `DREADD` or `DREADDDATA` index actions, because there are no servers it can send new documents to. In this case, the DIH pauses index queue processing until you reconfigure one or more child servers to set `UpdateOnly` to `False`.

You can also change this setting dynamically (without restarting the HPE DIH) by using the `EngineManagement` action. For example:

```
http://
DIHhost:ACIPort/action=EngineManagement&EngineAction=Edit&ID=1&UpdateOnly=True
```

## Set the Distribution Mode

You can configure the HPE DIH to run in one of two alternate modes:

- Mirror mode
- Non-mirror mode

### NOTE:

The `MirrorMode` parameter is set to `True` in the default configuration file. However, if you do not set the `MirrorMode` configuration parameter, HPE DIH runs in non-mirror mode.

## Run the Distributed Index Handler in Mirror Mode

In mirror mode the HPE DIH distributes all the index data it receives to all the connected IDOL Servers. The IDOL Servers are exact copies of each other and must all have the same configuration.

Run the HPE DIH in mirror mode to ensure uninterrupted service if one of the IDOL servers fails. If one IDOL Server is inoperable, its identical copies continue to index data and return data for queries.

The HPE DIH periodically checks if all the connected IDOL Servers are operating. If an IDOL server fails, the HPE DIH queues the data that this IDOL Server normally receives. When the IDOL Server starts operating again, it indexes the queued data into it.

### To run the HPE DIH in mirror mode

1. Open the HPE DIH configuration file in a text editor.
2. Find the `MirrorMode` setting in the `[Server]` section and set it to `True`.
3. Save and close the configuration file. Restart the HPE DIH for your changes to take effect.

#### NOTE:

When you change the `MirrorMode` configuration option to enable or disable mirror mode, you must also delete the `Main/` subdirectory in the HPE DIH installation directory.

This additional action prevents accidentally switching between mirror and non-mirror mode, which can cause a loss of data. If you do not delete the `Main/` directory when you change the `MirrorMode` option, HPE DIH does not start.

## Run the Distributed Index Handler in Non-Mirror Mode

In non-mirror mode the HPE DIH distributes the index data that it receives evenly across the connected IDOL Servers.

Run the HPE DIH in non-mirror mode if the amount of data to index is too large for a single IDOL Server. This option can reduce the index process time, particularly if the IDOL Servers that the HPE DIH indexes into are on different machines.

The HPE DIH periodically checks if all the connected IDOL Servers are operating. If an IDOL Server fails:

- In simple non-mirror distribution modes, the HPE DIH treats any IDOL Server that fails as `UpdateOnly`. While the child server is down, DIH queues any updates to existing documents, but distributes new content between the remaining child servers. This behavior ensures that all content is indexed into the available servers, but that document updates and deduplication occurs in the offline child server when it comes back online.
- In advanced distribution modes (see [Manage the Indexing Process, on the next page](#)), the DIH queues the data that this IDOL Server normally receives, and when the IDOL Server starts operating again, it indexes the queued data into it.

## To run the HPE DIH in non-mirror mode

1. Open the HPE DIH configuration file in a text editor.
2. In the [Server] section, find the `MirrorMode` setting and set it to `False`.
3. Save and close the configuration file. Restart the HPE DIH for your changes to take effect.

### NOTE:

When you change the `MirrorMode` configuration option to enable or disable mirror mode, you must also delete the `Main/` subdirectory in the HPE DIH installation directory.

This additional action prevents accidentally switching between mirror and non-mirror mode, which can cause a loss of data. If you do not delete the `Main/` directory when you change the `MirrorMode` option, HPE DIH does not start.

In non-mirror mode, you can choose various data distribution configurations.

- By default, the HPE DIH distributes data as soon as it receives the data. To send documents in batches, set the `DistributeOnBatch` configuration parameter (in the [Server] section of the HPE DIH configuration file) to `True`. This option can improve indexing speed, although the distribution of data among child servers can be more uneven.
- By default, the HPE DIH sends all index data to all child servers. To send the full document only to the child server that must index the content, set the `DistributeSendMinimal` configuration parameter. For more information, see [Send Minimal Documents, on page 46](#).

## Manage Client Connections

You can control several aspects relating to clients connecting to the HPE DIH. Use the following configuration parameters, which you set in the [Server] section of the HPE DIH configuration file.

<code>IndexClients</code>	The host machines that have permission to send index actions to HPE DIH. Set this to one or more host names or IP addresses. You can use Wildcard values.
<code>RecvTimeout</code>	How long the HPE DIH attempts to read an client index action before it times out. The default value is 60 seconds. A small value can improve the indexing speed, but might drop more actions.
<code>RecvDuration</code>	How long a communication between the HPE DIH and a client can last (in either direction). The default value is 600 seconds. A large value allows you to index more data with each action.

## Manage the Indexing Process

To tune indexing performance, you can adjust certain limits on the HPE DIH and its child servers.

- Specify how many times the HPE DIH attempts to send an index action to a child IDOL server before it assumes that the connection has failed.

Set the `MaximumRetries` configuration parameter (in the [Server] section of the HPE DIH configuration file) to the maximum number of attempts. The default value is 10.

- Limit the number of indexing threads that HPE DIH can employ.  
Set the value in the `Threads` configuration parameter (in the `[Server]` section of the HPE DIH configuration file). The default value is 10 threads. HPE recommends that you use  $(1 \times \text{Num. CPUs}) + 1$  spare thread.
- Limit the size of an indexing request string, which limits the amount of data that you can index in a single request.  
Set the `MaxInputString` configuration parameter (in the `[Server]` section of the HPE DIH configuration file) to the value that you want. The default value is 64000. A value of -1 means that there is no limit.
- Specify that HPE DIH must have a certain amount of available disk space for indexing to proceed.  
Set the `MinFreeSpaceMB` configuration parameter (in the `[Server]` section of the HPE DIH configuration file) to the minimum amount of disk space that HPE DIH must have. By default, HPE DIH must have 20 MB of disk space.
- Specify that a certain number of child IDOL servers must be running for indexing to proceed.  
Set the `MinChildrenAlive` configuration parameter (in the `[Server]` section of the HPE DIH configuration file) to the value that you want. By default, there is no minimum requirement.
- Stop the HPE DIH from turning DREADD actions into DREADDATA actions.  
Set the `PreserveDREADD` configuration parameter (in the `[Server]` section of the HPE DIH configuration file) to `True`. This option reduces network load by sending only the path to the IDX file to child servers, rather than streaming all the contents of the IDX file. You can use this parameter only in simple mirror or non-mirror mode. You must ensure that all child servers can access the file system containing the IDX file with the same file path.
- Use weighted indexing to alter the ratio in which documents distribute to different servers in standard distributed mode.  
Set the weight for different servers by using the `EngineManagement` action with the `Weight` parameter. For example:  

```
http://DIHhost:ACIPort/action=EngineManagement&EngineAction=Edit&ID=1&Weight=2
```

  
A server with weight 2 receives twice as many documents as a server with weight 1 and so on. You can set a weight of 0 to add no documents to a server.
- Use round-robin indexing to maximize indexing performance without compromising the IDOL Server pool availability. See [Round Robin Indexing, below](#).
- Use reference-based indexing to distribute the indexing load evenly between IDOL Servers. See [Reference-Based Indexing, on page 41](#).
- Use field-based indexing to distribute the indexing load evenly between IDOL Servers. See [Field-Based Indexing, on page 42](#).
- Use date-based indexing to distribute the indexing load between IDOL servers. See [Date-Based Indexing, on page 44](#).

## Round Robin Indexing

You can use round robin indexing with the HPE DIH to maximize indexing performance. This option rotates indexing over several child servers, so that only one HPE DIH indexes at a time.

A round robin HPE DIH forms part of a larger architecture that achieves extremely high performance and low search latency. IDOL Server provides the fastest queries when it is not indexing, and indexes fastest when it is not being queried. When you configure indexing for round robin mode, HPE DIH suspends query handling for a specific child server. This server then has optimal indexing, and only one child server receives most incoming documents.

If you have the DAH installed, you can configure the DAH to divert search queries to other IDOL servers to allow the active server to devote all its resources to the indexing task.

Use the [DAHServer*N*] section options to configure child servers for powerup and shutdown when round robin indexing rollover occurs. This option optimizes both query handling and data indexing across a group of child servers.

For example, DAH disables queries to the first server, which optimizes indexing speed for that server. Query handling is optimal for the other servers, which are not indexing data. The first server indexes data during this period, before DAH queries it again.

**NOTE:**

You can use round robin mode without installing the DAH to divert search queries from the active server. However, when the active server must perform search and indexing tasks simultaneously, it compromises performance for both.

To enable round robin mode, set RoundRobinMode to True in the [Server] section of the HPE DIH configuration file. You must complete the following sections in the HPE DIH configuration file (DAH portions apply only if you have installed it):

```
[Server]
Port=16000
DIHPort=16001
IndexClients=*. *.*.*.*
DateFormatCSVs=SHORTMONTH#SD+#SYYYY, DD/MM/YYYY, YYYY/MM/DD, YYYY-MM-DD
MirrorMode=False
RoundRobinMode=True

[DistributionIDOLServers]
Number=3

[IDOLServer0]
Host=localhost
Port=6502

[IDOLServer1]
Host=localhost
Port=6602

[IDOLServer2]
Host=localhost
Port=6702

[RoundRobinMode]
ServerImmediateStart=2
NextServerStartTime=00:00
```



```
NextServerStartDate=2006/10/20
PeriodInDay=1
```

```
[DAHServer0]
Host=dahhost0
Port=12000
ShutDownEnginePeriods=0, -1
```

```
[DAHServer1]
Host=dahhost1
Port=13000
StartUpEnginePeriods=-2
```

In this example, the HPE DIH immediately starts to send index data to IDOL Server 2. Indexing switches to the next server, IDOL Server 0, on 20 October 2006 at 00:00. After this period, HPE DIH dedicates one day for each child server before it rolls over to the next. To optimize data indexing when the rollover occurs, and to suspend query handling, it shuts down the DAH child servers that indexed data yesterday and today. At the same time, it powers up the DAH child server that indexed data the day before yesterday.

**NOTE:**

You can use `RoundRobinMode` only when `MirrorMode` is set to `False`. HPE DIH will not start if `RoundRobinMode` and `MirrorMode` are both set to `True`.

## Reference-Based Indexing

You can use reference-based indexing to distribute the indexing load evenly between IDOL Servers and achieve efficient data distribution. Data indexing depends on the reference of the documents. In simple non-mirror mode, HPE DIH sends all actions to all servers, and instructs the child servers to determine which documents to index. With reference-based indexing, HPE DIH performs these calculations, which reduces network traffic and load on the child servers.

When enabled, reference-based indexing applies to the `DREADD`, `DREADDATA`, and `DREREPLACE` index actions. You must configure the `DRREFERENCE` field by using standard field processing settings.

When you use reference-based indexing, you cannot alter the number of child servers.

In a chained HPE DIH setup, the HPE DIHs might distribute documents unevenly if more than one level of the chain uses reference-based indexing. To prevent uneven distribution, the number of child servers at each level must be coprime (that is, they have no common numerical factors).

For example, if you have a parent HPE DIH with two HPE DIH child servers, each of which has four IDOL Server children, documents are not distributed evenly in distribute-by-reference mode. The parent server splits the data into two using a checksum hash of the document reference. The first child server uses the same algorithm to distribute data to its four child servers. Because it has only the first half of the data, only two child servers receive data.

However, if you have a parent HPE DIH with two child servers, each of which has three IDOL Server children, data is distributed evenly in distribute-by-reference mode. The parent server splits the data into two. The first child server then splits the data into three, so that all child servers receive data.

**NOTE:**

Reference-based indexing might prevent deduplication of documents with different references. You can use reference-based indexing only with a `KillDuplicates=REFERENCE` or `KillDuplicates=NONE` setting in the `[Server]` section of the IDOL Server configuration file.

To enable reference-based indexing, set `DistributeByReference` to `True` in the `[Server]` section of the HPE DIH configuration file.

For example:

```
[Server]
Port=16000
DIHPort=16001
IndexClients=*. *.*.*.*
MirrorMode=False
DistributeByReference=True
```

**NOTE:**

You can use `DistributeByReference` only when `MirrorMode` is set to `False`. HPE DIH will not start if `DistributeByReference` and `MirrorMode` are both set to `True`.

You must also configure standard field processing options to specify the reference field to use to distribute documents. For more information, refer to the *IDOL Server Administration Guide*.

## Field-Based Indexing

You can use field-based indexing to distribute the indexing load between IDOL servers. This mode is similar to reference-based indexing, except that you configure the document fields that determine which child server to send the document to. Data indexing uses the value of the specified field in the documents being indexed or in which you replace fields.

When you enable field-based indexing, it applies to the `DREADD`, `DREADDDATA`, and `DREREPLACE` index actions. HPE DIH sends `DREREPLACE` index actions to all child servers, because the `DREREPLACE` action does not contain the information required to determine which child server contains the original document.

When you use field-based indexing, you cannot alter the number of child servers.

**NOTE:**

Field-based indexing might prevent deduplication of documents with different field values. You can use field-based indexing only with a `KillDuplicates=NONE` setting in the `[Server]` section of the IDOL Server configuration file.

### To enable field-based indexing

1. Open the HPE DIH configuration file in a text editor.
2. In the `[Server]` section, set the `DistributeByFields` parameter to `True`.
3. In the `[Server]` section, Set `DistributeByFieldsCSVs` to a comma-separated list of fields that HPE DIH uses to distribute index data between child servers. For example:

```
DistributeByFieldsCSVs=*/DeDupeHash,*/SecondDistributeField
```

4. Save and close the configuration file. Restart the HPE DIH for your changes to take effect.

For example:

```
[Server]
Port=16000
DIHPort=16001
IndexClients=*. *.*.*
MirrorMode=False
DistributeByFields=True
DistributeByFieldsCSVs=*/DeDupeHash,*/SecondDistributeField
```

**NOTE:**

You can use `DistributeByFields` only when `MirrorMode` is set to `False`. HPE DIH will not start if `DistributeByFields` and `MirrorMode` are both set to `True`.

You can also set the `BalanceDistributeByFields` configuration parameter to balance the distribution of documents that do not contain the specified distribution fields. In this option, HPE DIH sends documents to a random child server if they lack the specified distribution fields.

## Field Value-Based Indexing

By default, HPE DIH internally determines how to distribute documents between child servers. This process ensures that HPE DIH always sends duplicate documents to the same child server.

Instead, you can configure HPE DIH to distribute documents to specific child servers when the field contains a specific value.

### *To enable field value-based indexing*

1. Open the HPE DIH configuration file in a text editor.
2. In the `[Server]` section, set the `DistributeByFields` parameter to `True`.
3. In the `[Server]` section, set the `DistributeByFieldsCSVs` parameter to a comma-separated list of fields that HPE DIH uses to distribute index data between child servers.
4. In the `[IDOLServerN]` or `[DIHEngineN]` section for each group of child servers, set `DistributeByFieldsValues` to a comma-separated list of field values. If a document contains a field listed in the `DistributeByFieldsCSVs` parameter with this value, indexes it to this child server. For example:

```
[DIHEngine2]
DistributeByFieldsValues=backup,France
```

**NOTE:**

You can configure each field value in the list for only one child server. If a field value occurs in the list for multiple child servers, indexes matching documents into the child server with the lowest ID.

5. In the `[Server]` section, set the `UnknownFieldValueAction` parameter to the action that HPE DIH takes if the fields listed in the `DistributeByFieldsCSVs` parameter contain unknown values. The following actions are available:

Distribute	HPE DIH uses a hash of the field values to distribute the document, as with conventional field-based indexing.
Ignore	HPE DIH ignores the document and logs a warning.
Default	HPE DIH sends the document to the server specified by the <code>UnknownFieldValueDefaultEngine</code> configuration parameter.

For example:

```
UnknownFieldValueAction=Distribute
```

- In the `[Server]` section, set `UnknownFieldValueDefaultEngine` to the number of the child server that acts as the default server. Set this parameter only if you have set `UnknownFieldValueAction` to `Default`.
- In the `[Server]` section, set `DistributeOnMultipleFieldValues` to `True` if you want to index documents into each server group that matches the particular field values. Set this parameter to `False` if you want the document to index only into the server with the lowest number.
- Save and close the configuration file. Restart the HPE DIH for your changes to take effect.

For example:

```
[Server]
DistributeByFields=True
DistributeByFieldsCSVs=*/database,*/country
UnknownFieldValueAction=Default
UnknownFieldValueDefaultEngine=0
DistributeOnMultipleFieldValues=True
```

```
[DIHEngines]
Number=3
```

```
[DIHEngine0]
DistributeByFieldsValues=main
```

```
[DIHEngine1]
DistributeByFieldsValues=uk
```

```
[DIHEngine2]
DistributeByFieldsValues=backup,france
```

## Date-Based Indexing

You can use date-based indexing to distribute the indexing load between IDOL servers. Date-based indexing uses the date of the documents being indexed or in which you replace fields.

When you enable date-based indexing, HPE DIH indexes each document in a `DREADD` and `DREADDATA` action by its `#DREDATE` field, or another `DateType` field configured in the `[FieldProcessing]` section. It indexes each replace in a `DREREPLACE` action based on its `#DREDATE` line, if it exists. Otherwise it sends the action to all child servers. It sends all other actions to all child servers.

When you use date-based indexing, you cannot alter the number of child servers.

To enable date-based indexing, set `DistributeByDate` to `True` in the `[Server]` section of the HPE DIH configuration file.

Configure the date ranges for child servers by using a `[DateRangeN]` subsection in the `[DistributionIDOLServers]` section of the HPE DIH configuration file.

For both HPE DIH stand-alone and unified configuration, you must configure `DateFormatCSVs` in the `[Server]` section for date-based indexing to work. For example:

```
[Server]
Port=16000
DIHPort=16001
IndexClients=*. *.*.*
MirrorMode=False
DistributeByDate=True
DateFormatCSVs=DD/MM/YYYY,YYYY/MM/DD,YYYY-MM-DD
```

```
[DistributionIDOLServers]
Number=2
```

```
[IDOLServer0]
Host=localhost
Port=9000
```

```
[IDOLServer1]
Host=localhost
Port=9500
```

```
[DateRange0]
FromDate=1980/01/01
UpToDate=1990/01/01
Engines=0
```

```
[DateRange1]
FromRelative=-3
UpToRelative=5
Engines=1
```

In this example, server 0 indexes documents dated from 1 January 1980 to 31 December 1989. If it is Tuesday (relative 0), server 1 gets documents dated from the previous Saturday (relative -3) and from the following Saturday (relative 4). The upper limit is exclusive.

**NOTE:**

You can use `DistributeByDate` only when `MirrorMode` is set to `False`. HPE DIH will not start if `DistributeByDate` and `MirrorMode` are both set to `True`.

## Send Minimal Documents

In non-mirror mode, you can configure HPE DIH to send each child server only the information it needs. In `DistributeSendMinimal` mode, the HPE DIH determines which child server must index each document, and sends the complete document only to that child server.

HPE DIH sends a minimal representation of the document to all other child servers. The content of this representation is defined by the `KillDuplicates` mode of the original index action.

This mode allows all child servers to perform correct deduplication, and reduces network traffic to child servers.

To enable minimal sending mode, set the `DistributeSendMinimal` configuration parameter to `True` in the `[Server]` section. For example:

```
[Server]
MirrorMode=False
DistributeSendMinimal=True
```

### NOTE:

When you want to deduplicate on a field other than `DRREFERENCE`, you must configure a field process in the DIH configuration file, with the fields that you want to use to deduplicate. DIH then includes these fields in the representation that it sends to its child servers. By default, it sends only the `DRREFERENCE`.

For more information about setting up a field process, refer to the *IDOL Server Administration Guide*.

## Use Consistent Hashing

In the `DistributeByReference` and simple `DistributeByFields` modes, you can use consistent hashing mode to create a more flexible HPE DIH architecture. In consistent hashing mode, you can add, remove, or change the weight of child servers in your HPE DIH without having to reindex all your content.

### NOTE:

To use consistent hashing, you must have Content component version 10.1.1 or later in your child servers.

In consistent hashing mode, HPE DIH creates a large, fixed number of *virtual nodes*. You configure the number of virtual nodes to be much larger than your intended number of child servers. HPE DIH assigns the virtual nodes to one or more of your configured child servers.

When you index content, HPE DIH distributes the data between the virtual nodes, according to your distribution mode (`DistributeByReference` or `DistributeByFields`). HPE DIH creates a `DREVNODE` field in each document, which stores details of the virtual node, and then indexes the document to the assigned child servers for the virtual node.

### NOTE:

You cannot use consistent hashing mode in a distribution architecture with tiered DIH servers.

You also cannot use consistent hashing mode with `DistributeByFieldValues`. `DistributeByFieldValues` determines the child server to send a document to according to a specific value in a field, so it sends data to specific child servers, rather than to virtual nodes.

If you change the number or weight of child servers, HPE DIH can redistribute the virtual nodes between the new set of servers. It modifies its internal mapping to assign the virtual nodes evenly among the new set of servers. It then sends index actions to export data from some servers and index it into others to redistribute the data.

### Related Topics

- [Reference-Based Indexing, on page 41](#)
- [Field-Based Indexing, on page 42](#)

## Configure Consistent Hashing

The following procedures describe how to configure consistent hashing mode in your HPE DIH and child IDOL servers.

### Configure the DIH for Consistent Hashing Mode

The following procedure describes the configuration changes to the HPE DIH that enable consistent hashing mode. To use consistent hashing, you must configure HPE DIH in `DistributeByReference` or `DistributeByField` mode.

#### NOTE:

After you configure the number of `VirtualNodes` and `Replicas` for your system, you cannot change these values. If you want to change these numbers, you must use a clean DIH installation and reindex all your content.

For more information about these parameters, refer to the *DIH Reference*.

#### To configure consistent hashing in the HPE DIH

1. Open the HPE DIH configuration file in a text editor.
2. In the `[Server]` section, set the `UseConsistentHashing` parameter to `True`. In a unified IDOL configuration, set this parameter in the `[DistributionSettings]` configuration section. For example:

```
[Server]
UseConsistentHashing=True
```

3. Create a `[ConsistentHashing]` section.
4. Set the `VirtualNodes` parameter to the number of virtual nodes that you want to create. HPE DIH rounds this value up to the nearest power of two (for example, if you set `VirtualNodes` to `4000`, it creates 4,096 virtual nodes).

HPE recommends that you set the value of `VirtualNodes` to be an order of magnitude higher than the number of child servers that you expect to use.

The minimum value is the higher number of 33 (that is, 64 nodes), or the number of child servers in your system. If you create fewer virtual nodes than there are child servers, HPE DIH

does not start. In general, HPE recommends that you do not reduce the default value of virtual nodes (4,096).

5. (Optional) Set the `Replicas` parameter to the number of identical copies of each document that you want to index. When you configure replicas, DIH copies the documents in a particular virtual node to two or more child servers. For more information, refer to the *Distributed Index Handler Reference*.
6. Save and close the HPE DIH configuration file.

## Configure the Child Servers for Consistent Hashing Mode

The following procedure describes the configuration changes to the child IDOL servers that are required for consistent hashing mode.

### To configure consistent hashing for the child servers

1. Open the configuration file for one of your child IDOL or Content servers.
2. In the `[FieldProcessing]` section, add a new field process at the bottom of the list, and increase the value of the `Number` parameter by one. For example:

```
[FieldProcessing]
Number=4
0=SetIndexFields
1=SetReferenceFields
2=SetSectionBreakFields
3=SetVNodeReferenceField
```

#### NOTE:

You must create a new field process, rather than adding the field to an existing reference process.

3. Create a new configuration section for the field process. Set `PropertyFieldCSVs` to `*/DREVNODE`, and set `Property` to the name of a new property. For example:

```
[SetVNodeReferenceField]
Property=VNodeReferenceField
PropertyFieldCSVs=*/DREVNODE
```

4. Create a configuration section for the corresponding property. Set the `ReferenceType` and `TrimSpaces` properties to `True`. You might also want to use the `HiddenType` property for this field. For example:

```
[VNodeReferenceField]
ReferenceType=True
TrimSpaces=True
HiddenType=True
```

5. Save and close the configuration file. Restart the child server for your changes to take effect.
6. Repeat Step 1 to Step 5 for each of your child servers.



## Configure the DAH

In consistent hashing mode when you have not configured replicas, you do not need to make any changes to the DAH configuration, except when you add or remove child servers.

When you configure replicas, the HPE DIH distributes identical copies of the virtual nodes between its child servers, ensuring that it does not assign the copies to the same child server. Unlike full server mirroring, the DAH does not know where each of the copies are. In this case, you must:

- configure your DAH in simple combinator mode
- combine query results by reference

For more details about these settings, refer to the *DAH Administration Guide* and *IDOL Server Reference*.

In addition, when you send a `GetQueryTagValues` action to the DAH in a system that uses replicas, the document counts for tags include a value for each copy of the document that exists (that is, the action counts each replica as a separate document).

## Index Data in Consistent Hashing Mode

In consistent hashing mode, HPE recommends that you do not use the `Priority` index action parameter for any action that affects your data (for example, `DREADDDATA`, `DREREPPLACE`, `DREDELETEREF`). You can use index action priorities for purely administrative index actions as usual (for example `DRESYNC`, `DRECOMPACT`, `DREBACKUP`).

## Add, Change, and Remove Child Servers in Consistent Hashing Mode

In consistent hashing mode, you can add or remove child servers, and change the weight of a child server, without reindexing all your content. This process uses the `EngineManagement` action and the `DREREDISTRIBUTE` index action to change your child server arrangement and redistribute the data respectively.

When the HPE DIH receives a `DREREDISTRIBUTE` index action, it checks whether redistribution is required. If it is, the HPE DIH remaps the virtual nodes, and automatically sends export and add index actions to its child servers to redistribute the associated content.

### NOTE:

DIH can process only one `DREREDISTRIBUTE` index action at the same time. If it starts to process a second `DREREDISTRIBUTE` index action in the queue before all child servers have finished redistributing the content, the second `DREREDISTRIBUTE` index action returns the `Unavailable` error code and does not run.

## Add a New Child Server

Use the following procedure to add a new child server in consistent hashing mode.

**To add a child server**

1. Send the `EngineManagement` action to the HPE DIH ACI port. Set the `EngineAction` parameter to `Add`, and set `Host` and `Port` to the host and port of the new child server. For example:

```
action=EngineManagement&EngineAction=Add&Host=Child3&Port=9000
```

You can also add a new child server to the last listed existing mirror group by setting the `Group` parameter in the `EngineManagement` action to the ID of the group.

2. Send the `DREREDISTRIBUTE` index action to the DIH index port. This index action checks whether redistribution is required, and runs the export and indexing process.

```
http://12.3.4.56:20001/DREREDISTRIBUTE
```

**Change the Weight of a Child Server**

Use the following procedure to change the weight of a child server in consistent hashing mode.

**To change the weight of a child server**

1. Send the `EngineManagement` action to the HPE DIH ACI port. Set the `EngineAction` parameter to `Edit`, set `ID` to the ID number of the child server in the HPE DIH configuration file, and set `Weight` to the new weight for this child server. For example:

```
action=EngineManagement&EngineAction=Edit&ID=3&Weight=5
```

2. Send the `DREREDISTRIBUTE` index action to the HPE DIH index port to redistribute the index data between child servers according to the new weighting.

```
http://12.3.4.56:20001/DREREDISTRIBUTE
```

**Remove a Child Server**

Use the following procedure to remove a child server group in consistent hashing mode. You cannot remove a group that has virtual nodes assigned, and you can remove only whole groups of servers.

**To remove a child server**

1. Use the `EngineManagement` action to set the weight for the child server to zero. Set the `EngineAction` parameter to `Edit`, set `ID` to the ID number of the child server in the HPE DIH configuration file, and set `Weight` to 0 (zero).

```
action=EngineManagement&EngineAction=Edit&ID=3&Weight=0
```

2. Send the `DREREDISTRIBUTE` index action to the HPE DIH index port to redistribute the index data between child servers according to the new weighting.

```
http://12.3.4.56:20001/DREREDISTRIBUTE
```

This index action removes all the virtual nodes from the child server. HPE DIH continues to send any mirrored index actions (such as `DRESYNC` and `DRECOMPACT`) to this child server until you remove it completely.

3. After the redistribution index action is complete, send the `EngineManagement` action again. Set the `EngineAction` parameter to `Remove`, and set `Group` to the ID of the group.

## Manage the Index Queue

The HPE DIH maintains an internal queue of unfinished index actions that it receives. By default, the index queue size grows if the DIH needs to accept new index actions (that is, it does not discard jobs that have not been completed).

To tune indexing performance, you can control certain characteristics of the queue.

- You can pre-size the HPE DIH index queue by setting the `IndexQueueInitialSize` parameter in the `[IndexQueue]` section of the configuration file. When you know that HPE DIH is going to receive a large number of index jobs, you can use this option to reduce the number of times that HPE DIH resizes the index queue.
- You can limit the size of the index queue by setting the `IndexQueueMaxPendingItems` parameter in the `[IndexQueue]` section of the configuration file. This parameter limits the number of incomplete index actions on the queue. When the queue size reaches this limit, HPE DIH rejects any further index actions. You can override the queue limit for an individual index action by using the `IgnoreMaxPendingItems` index action parameter.
- You can specify the maximum number of finished (historical) index actions by setting the `IndexQueueMaxHistory` configuration parameter in the `[IndexQueue]` section of the configuration file. In this case, HPE DIH keeps the most recent finished actions, and removes the oldest.
- By default, the HPE DIH periodically polls each job in the index queue to see whether it is complete. When a job is complete,
  - Specify how often the polling occurs by modifying the `PollInterval` configuration parameter in the `[Server]` section of the HPE DIH configuration file. The default value is 10 seconds. Frequent polling might help to keep the queue size down if you exceed the number of jobs specified in the `IndexQueueMaxHistory` configuration parameter. However, polling too frequently might affect indexing performance.
  - You can turn off polling completely by setting the `Polling` configuration parameter to `False`. In this case, HPE DIH marks the job as complete as soon as it sends it to the child servers. HPE DIH keeps the number of finished jobs specified by `IndexQueueMaxHistory`. Turn off polling for all child servers by setting `Polling` to `False` in the `[Server]` section. Alternatively, turn off polling for individual child servers by setting `Polling` to `False` in the `[IDOLServerN]` section.
- You can specify a directory for the HPE DIH to use to store index queue status files. By default, it stores the files in the `./main` directory, relative to the HPE DIH executable. Set the `Main` configuration parameter (in the `[Paths]` section of the HPE DIH configuration file) to the full or relative path to the directory to use.

## Archive Information

You can archive records of index actions that the HPE DIH receives and documents that the HPE DIH was unable to index.

## Archive Actions

Use the following procedure to set up archiving for index actions. The archived data includes any data that you send in the action.

### *To enable archiving of index actions*

1. Open the HPE DIH configuration file in a text editor.
2. In the [Server] section, set `ArchiveMode` to `True`.
3. In the [Paths] section, set `Archive` to the path (either absolute or relative to the HPE DIH executable) to a directory to store the list of actions in.
4. In the [Server] section, set `ArchiveFolderDateFormat` to the IDOL date format string to use to name the folders. You can also use forward slashes (/) as path separators to specify subfolders. For example:

```
ArchiveFolderDateFormat=YYYY_MM_DD/HH/NN
```

In this example, an archive folder is produced every day, with a subfolder every hour, each with a further subfolder every minute. The default value is `YYYY_MM_DD`.

5. In the [Server] section, set `CompressArchive` to `True` if you want to compress the action archive to save disk storage space.
6. In the [Server] section, set `ArchiveUseHashDir` to `False` if you do not want to use a hashed directory structure in your archive folder (64 folders each containing 64 folders).  
A hashed directory structure can avoid slow file operations that can occur in some file systems when there are many files in a single folder. If you have set `ArchiveFolderDateFormat` to give a small time interval for each folder, hashed directories might not be necessary.
7. Save and close the configuration file. Restart the HPE DIH for your changes to take effect.

## Archive Failed Documents

Use the following procedure to set up archiving for documents that the HPE DIH was unable to index.

### *To enable archiving of failed documents*

1. Open the HPE DIH configuration file in a text editor.
2. In the [Server] section, set the `ArchiveFailedTasks` parameter to `True`.
3. In the [Paths] section, set the `Failed` configuration parameter to the path (either absolute or relative to the HPE DIH executable) to a directory to store the unindexed documents in.
4. Save and close the configuration file. Restart the HPE DIH for your changes to take effect.

## Set Up SSL Connections

You can configure Secure Socket Layer (SSL) connections between the HPE DIH and other servers. You can configure SSL connections in a combination of different configuration sections:

- [Server]. Configure SSL in this section for connections for incoming ACI calls. You can configure this section in either the IDOL configuration file or the HPE DIH configuration file, depending on whether the system uses a unified or stand-alone setup.

**NOTE:**

In a unified IDOL setup, you must set the `SSLConfig` configuration parameter in the [Server] section, rather than the [DistributionSettings] section.

- [IDOLServer $N$ ] or [DIHEngine $N$ ]. Configure SSL in this section for connections for outgoing ACI calls. You can set this option in either the IDOL configuration file or HPE DIH configuration file, depending on whether the system uses a unified or stand-alone setup.

You can also configure SSL connections between HPE DIH and the service port of the child servers by using the `ServiceSSLConfig` parameter in this section.

- [IndexServer]. Configure SSL in this section for connections for the index port.

**To configure an SSL connection**

1. Open the configuration file in a text editor. If you use a unified setup, use the IDOL Server configuration file. If you use a stand-alone setup, use the HPE DIH configuration file.
2. Find the [Server], [IDOLServer $N$ ], or [DIHEngine $N$ ] section, or create an [IndexServer] section.
3. Add the `SSLConfig` setting to specify the section in which you set the SSL details for the connection, usually `SSLOption $N$` . For example:

```
[Server]
(other server settings...)
SSLConfig=SSLOption0
```

```
[IDOLServer0]
SSLConfig=SSLOption0
```

```
[IDOLServer1]
SSLConfig=SSLOption1
```

In this example, incoming ACI calls and outgoing calls to `IDOLServer0` share the same SSL configuration, and outgoing calls to `IDOLServer1` use a different configuration.

4. In the [IDOLServer $N$ ] section or the [DIHEngine $N$ ] section, add the `ServiceSSLConfig` setting to the name of the section in which you set the SSL details for connections to the child server service port.
5. Create an [SSLOption $N$ ] section for each unique `SSLConfig` or `ServiceSSLConfig` setting. Each `SSLOption` entry must contain the `SSLMethod`, `SSLCertificate`, and `SSLPrivateKey` parameters. For example:

```
[SSLOption0]
SSLMethod=TLSV1.2
SSLCertificate=host1.crt
SSLPrivateKey=host1.key
```

```
[SSLOption1]
SSLMethod=TLSV1.2
```

```
SSLCertificate=host2.crt
SSLPrivateKey=host2.key
```

6. Save and close the configuration file. Restart IDOL Server (for a unified setup) or the HPE DIH (for a stand-alone setup) for your changes to take effect.

## Customize Logging

You can customize logging by setting up your own *log streams*. Each log stream creates a separate log file in which specific log message types (for example, action, index, application, or import) are logged.

### To set up log streams

1. Open the HPE Distributed Index Handler configuration file in a text editor.
2. Find the [Logging] section. If the configuration file does not contain a [Logging] section, add one.
3. In the [Logging] section, create a list of the log streams that you want to set up, in the format *N=LogStreamName*. List the log streams in consecutive order, starting from 0 (zero). For example:

```
[Logging]
LogLevel=FULL
LogDirectory=logs
0=ApplicationLogStream
1=ActionLogStream
```

You can also use the [Logging] section to configure any default values for logging configuration parameters, such as LogLevel. For more information, see the *HPE Distributed Index Handler Reference*.

4. Create a new section for each of the log streams. Each section must have the same name as the log stream. For example:

```
[ApplicationLogStream]
[ActionLogStream]
```

5. Specify the settings for each log stream in the appropriate section. You can specify the type of logging to perform (for example, full logging), whether to display log messages on the console, the maximum size of log files, and so on. For example:

```
[ApplicationLogStream]
LogTypeCSVs=application
LogFile=application.log
LogHistorySize=50
LogTime=True
LogEcho=False
LogMaxSizeKBs=1024

[ActionLogStream]
LogTypeCSVs=action
LogFile=logs/action.log
LogHistorySize=50
```

```
LogTime=True  
LogEcho=False  
LogMaxSizeKBs=1024
```

6. Save and close the configuration file. Restart the service for your changes to take effect.

# Chapter 4: Operate the Distributed Index Handler

This chapter describes the actions you can perform with the HPE DIH.

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- [Manage Databases](#) ..... 65
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## Start and Stop the Distributed Index Handler

You can use several different methods to start and stop the HPE DIH.

### Start the Distributed Index Handler

The following sections describe the different ways that you can start the HPE DIH.

Before you can start the DIH, you must start the License Server.

#### Start the DIH on Microsoft Windows

- Double-click the `DIH.exe` file in your component installation directory.
- Start the DIH service from a system dialog box. DIH must be installed as a Windows Service. See [Install an IDOL Component as a Service on Windows, on page 15](#).
  1. Display the Windows **Services** dialog box.
  2. Select the **DIH** service for the component, and click **Start** to start the component.
  3. Click **Close** to close the **Services** dialog box.

**TIP:**

You can also configure the Windows Service to run automatically when you start the machine.

- Start a component from the command line. For more information, refer to the *IDOL Getting Started Guide*.

#### Start the DIH on UNIX

- Start the IDOL component service from the command line. The component must be installed as a service. See [Install an IDOL Component as a Service on Linux, on page 18](#) You can use one of the following commands to start the service:
  - On systemd Linux platforms:

```
systemctl start DIH
```
  - On System V Linux platforms:



```
service DIH start
```

- On Solaris platforms (using System V):

```
/etc/init.d/DIH start
```

**TIP:**

You can also configure the service to run automatically when you start the machine.

- Start the DIH from the command line. For more information, refer to the *IDOL Getting Started Guide*.
- Use the start script (`start-dih.sh`).

**NOTE:**

In most cases, HPE recommends that you use the provided init scripts instead.

## Stop the Distributed Index Handler

You can stop the DIH from running in several different ways.

- (All Platforms) Send the *Stop* service action to the component service port:

```
http://host:servicePort/action=stop
```

where *host* is the name or IP address of the host on which the DIH is running, and *servicePort* is the component service port (which is specified in the [Service] section of the HPE Distributed Index Handler configuration file).

- On Windows platforms, when the component is installed as a service, you can use the system dialog box to stop the service:
  1. Display the Windows **Services** dialog box.
  2. Select the **DIH** service, and click **Stop** to stop HPE Distributed Index Handler.
  3. Click **Close** to close the **Services** dialog box.
- On UNIX platforms, when the component is installed as a service, you can run one of the following commands to stop the service:
  - On systemd platforms:
 

```
systemctl stop DIH
```
  - On system V platforms:
 

```
service DIH stop
```
  - On Solaris platforms (using System V):
 

```
/etc/init.d/DIH stop
```
- On UNIX platforms, you can also use the stop script, `stop-dih.sh`.

## Index Data with the DIH

You can send either of two IDOL Server indexing actions to the HPE DIH. For complete information about these index actions and their parameters, refer to the *IDOL Server Administration Guide* and the *Distributed Index Handler Reference*.

### Use DREADD

The HPE DIH accepts the DREADD indexing action, which allows you to send data (that is accessible to the HPE DIH through the file system) directly to the HPE DIH for indexing. Use the following action syntax:

```
http://DIHhost:IndexPort/DREADD?parameters
```

When you send this action to the HPE DIH instead of to an IDOL Server, note that:

- *DIHhost* and *IndexPort* are the host and index port of the HPE DIH, not of any of its child IDOL Servers.
- In mirror mode, HPE DIH sends the data to every child IDOL server for indexing. In simple non-mirror mode, the HPE DIH decides which IDOL server receives index data, but all IDOL servers receive all actions. Use reference-based indexing or `DistributeSendMinimal` to further reduce the amount of traffic and IDOL Server load by allowing the HPE DIH to distribute index data and index actions.
- When you use the `PreserveDREADD` configuration option, all the child servers must have access to the index file.

### Use DREADDATA

The HPE DIH accepts the DREADDATA indexing action, which allows you to send data over a socket to the HPE DIH for indexing. This action requires a POST request method. Use the following action syntax:

```
http://
DIHhost:IndexPort/DREADDATA?optionalParamsData#DREADDATAkillDuplicatesOption\n\n
```

When you send this action to the HPE DIH instead of to an IDOL Server, note:

- *DIHhost* and *IndexPort* are the host and index port of the HPE DIH, not of any of its child IDOL Servers.
- In mirror mode, HPE DIH sends the data to every child IDOL server for indexing. In simple non-mirror mode, the HPE DIH decides which IDOL server indexes the data, but all IDOL servers receive all actions. Use reference-based indexing or `DistributeSendMinimal` to further reduce the amount of traffic and IDOL server load by allowing the HPE DIH to distribute index data and index actions.

## Check Indexing Status

You can check whether the HPE DIH has successfully indexed data into the connected IDOL servers by running the following action:

```
http://DIHhost:ACIport/action=IndexerGetStatus
```

where,

- *DIHhost* is the IP address or host name of the machine on which HPE DIH is installed.
- *ACIport* is the port that you use to send ACI actions to the HPE DIH (set in the `Port` parameter in the `[Server]` section of the HPE DIH configuration file).

The `IndexerGetStatus` action displays the status of the IDOL Server index queue.

### Example

The following example shows the action response from the HPE DIH when you send an `IndexerGetStatus` action to the HPE DIH after a `DREADD` index action:

```
<autnresponse>
<action>INDEXERGETSTATUS</action>
<response>SUCCESS</response>
<responsedata>
<item>
  <id>1</id>
  <origin_ip>127.0.0.1</origin_ip>
  <received_time>2008/10/22 11:30:13</received_time>
  <start_time>2008/10/22 11:30:14</start_time>
  <end_time>2008/10/22 11:32:14</end_time>
  <duration_secs>120</duration_secs>
  <percentage_processed>100</percentage_processed>
  <status>-1</status>
  <description>Finished</description>
  <index_command>
    /DREADD?myfile.idx&KILLDUPLICATES=REFERENCE&DREDBNAME=Archive
  </index_command>
</item>
</responsedata>
</autnresponse>
```

where,

Tag name	Description
<id>	The ID number of the index action.
<origin_ip>	The IP address of the machine that sent the index action to the HPE DIH.
<received_time>	The time that the HPE DIH received the action.

Tag name	Description
<start_time>	The time that the HPE DIH started processing the index action.
<end_time>	The time that the HPE DIH finished processing the index action.
<duration_secs>	The total amount of time in seconds that the HPE DIH spent processing the index action.
<status>	The status code of the current status of the index action in the HPE DIH index queue. See <a href="#">IndexerGetStatus Status Codes, below</a> .
<description>	The description of the <status> number.
<index_command>	The index action that was used for the index job.

## IndexerGetStatus Status Codes

### NOTE:

Codes in **bold** are status messages. All other codes indicate there is a problem with the indexing process.

Code	Message	Explanation
<b>-1</b>	Finished	The indexing process is complete.  By default, the action reports a job as finished only when all the child servers report the job as finished. This behavior can result in large queue sizes. To mark each job as finished when one child server completes it, set the <code>Polling</code> parameter in the <code>[Server]</code> section of the DIH configuration file to <code>False</code> .
<b>-2</b>	Out of disk space	IDOL Server ran out of disk space before the indexing process was completed.
<b>-3</b>	File not found	The index file was not found.
<b>-4</b>	Database not found	The database that you tried to index into was not found.
<b>-5</b>	Bad parameter	The indexing action syntax is incorrect.
<b>-6</b>	Database exists	The database that you tried to create already exists.
<b>-7</b>	Queued	HPE DIH queues the indexing action and runs it when all preceding indexing actions are complete.
<b>-8</b>	Unavailable	IDOL Server is about to shut down or indexing is paused.
<b>-9</b>	Out of Memory	IDOL Server ran out of memory before the indexing process was completed.
<b>-10</b>	Interrupted	The indexing action was interrupted.

Code	Message	Explanation
-11	XML is not well formed	Indexing failed because the XML is not well formed.
-12	Retrying interrupted command	IDOL Server is running an indexing action that was previously interrupted.
-13	Backup in progress	IDOL Server is performing a backup.
-14	Max index size reached	The indexing job exceeds the maximum indexing size (your license determines the maximum indexing size).
-15	Max number of sections reached	The indexing job exceeds the maximum number of sections that you can index (your license determines the number of sections you can index).
-16	Indexing Paused	The indexing process was paused.
-17	Indexing Resumed	The indexing process was restarted.
-18	Indexing Cancelled	The indexing process was cancelled.
-19	Out of file descriptors	IDOL Server ran out of file descriptors.
-20	LanguageType not found	The language type of the index data was not found.
-21	SecurityType not found	The security type of the index data was not found.
-22	Child engines returned differing messages	The child servers returned different messages to the HPE DIH. This code is reported only by HPE DIH.
-23	Badly formatted index command	The indexing action was rejected by a child server because the syntax is not valid.
-25	To be sent to DRE	HPE DIH queues the index action to send to the IDOL Server. This code is reported only by HPE DIH.
-26	DREADDATA: Data received did not include #DREENDDATA	The data in the DREADDATA action did not contain a #DREENDDATA statement to indicate the end of the data.
-27	Command failed more times than the configured retry limit	The indexing action exceeded the maximum number of retries specified by the <code>MaximumRetries</code> parameter in the HPE DIH configuration. This code is reported only by HPE DIH.
-28	The index ID specified is invalid	The index ID returned by the child server is not valid. This code is reported only by HPE DIH.
-29	Command was redistributed to sibling engines as this engine was either unavailable or not accepting index	The indexing action was sent to sibling servers because the child server was either unavailable or not accepting indexing jobs. This code is reported only by HPE DIH.

Code	Message	Explanation
	jobs	
-30	Database name too long	The name of the database that you are indexing documents into is too long. The maximum length is 63 characters.
-31	Command ignored due to id match	The DREINITIAL action was not processed because it did not match the ID specified in the InitialID parameter.
-33		IDOL Server cannot create the database because it has reached the maximum number of databases. The maximum is 32,767.
-34	Pending commit	The indexing job is complete and the documents are available for searching after the next delayed synchronization cycle, which you specify in the DeLayedSync parameter.
-35	Initializing	HPE DIH is starting the indexing job. This code is reported only by HPE DIH.
-36	Reading IDX	HPE DIH is reading the IDX file from disk, prior to sending it to IDOL Server. This code is reported only by HPE DIH.

**NOTE:**

If the IndexerGetStatus action returns a positive number, this number indicates the percentage of the indexing queue that is complete.

## Administer IDOL Servers

You can use the following IDOL Server index actions to administer the IDOL Servers managed by the HPE DIH. Refer to the *IDOL Server Reference* for complete information on these actions and their parameters.

## Implement Configuration Changes

When you make changes to the configuration files of one or more IDOL Servers, you can send the DRERESET index action to the HPE DIH to ensure that all its child IDOL Servers implement the changes. Use the following action syntax:

```
http://DIHhost:IndexPort/DRERESET?
```

When you send this action to the HPE DIH instead of to an IDOL server, note:

- *DIHhost* is the IP address (or name) of the machine on which the HPE DIH is installed. *IndexPort* is the number of the port that you use to send index actions to the HPE DIH.
- This action resets all child IDOL servers of the HPE DIH.

## Compact the IDOL Servers

The DRECOMPACT index action allows the HPE DIH to reduce the space that documents take up in the IDOL Servers. The compact operation (similar to the defragmentation process) uses new documents to fill up the space that has been created through the deletion of other documents. Use the following action syntax:

```
http://DIHhost:IndexPort/DRECOMPACT?
```

When you send this action to the HPE DIH instead of to an IDOL Server, note:

- *DIHhost* is the IP address (or name) of the machine on which the HPE DIH is installed, and *IndexPort* is the number of the port that you use to send index actions to the HPE DIH.
- This action compacts all child IDOL servers of the HPE DIH.

## Back up the IDOL Servers

The DREBACKUP index action allows the HPE DIH to back up the data in its child IDOL Servers, to create a safe copies of the data. You can subsequently use a DREINITIAL index action to restore the backed up files to the IDOL Servers.

### To back up IDOL Server

1. Send a DRECOMPACT index action to the HPE DIH to compress the connected IDOL Servers (see [Compact the IDOL Servers, above](#)).
2. Send the following action from your Web browser to copy all the IDOL Server \*.DB files to a new location:

```
http://DIHhost:IndexPort/DREBACKUP?Path
```

When you send this action to the HPE DIH instead of to an IDOL Server, note:

- *DIHhost* is the IP address (or name) of the machine on which the HPE DIH is installed, *IndexPort* is the number of the port that you use to send index actions to the HPE DIH, and *Path* is the path to the location where you want to create the IDOL Server backup.
- If the IDOL Servers are installed on different machines, you must ensure that the specified path is a valid directory path on each of the machines.
- If any two IDOL Servers are installed on one machine, you can specify a relative path. However, you must ensure that multiple IDOL Servers do not back up to the same location.

### To restore backed-up data to IDOL Server

- Send the following action from your Web browser to restore the files to all databases on all child IDOL Servers:

```
http://DIHhost:IndexPort/DREINITIAL?Path
```

When you send this action to the HPE DIH instead of to an IDOL Server, note:

- *DIHhost* is the IP address (or name) of the machine on which the HPE DIH is installed, *IndexPort* is the number of the port that you use to send index actions to the HPE DIH, and

*Path* is the path (previously specified in DRECOMPACT) to the location to store the IDOL Server backups.

## Initialize the IDOL Servers

The DREINITIAL index action allows the HPE DIH to delete the data that each child IDOL server contains and reset the server to the state it was in when first installed. Use the following action syntax:

```
http://DIHhost:IndexPort/DREINITIAL?
```

When you send this action to the HPE DIH instead of to an IDOL server, note:

- *DIHhost* is the IP address (or name) of the machine on which the HPE DIH is installed, and *IndexPort* is the number of the port that you use to send index actions to the HPE DIH.
- All child servers of the HPE DIH are reset.

## Disable the IDOL Servers

You can use the EngineManagement action to dynamically take child servers offline (without restarting the HPE DIH). Send the EngineManagement action with the EngineAction parameter set to Edit and the Disabled parameter set to True to temporarily disable a child server of the HPE DIH:

```
http://DIHhost:ACIPort/action=EngineManagement&EngineAction=Edit&ID=1&Disabled=True
```

This action disables the server with ID 1. When a child server is disabled, the HPE DIH continues to assign documents and queue index actions. It does not attempt to send them until you enable the server again, by sending another EngineManagement action. For example:

```
http://
DIHhost:ACIPort/action=EngineManagement&EngineAction=Edit&ID=1&Disabled=False
```

This behavior is identical to when the HPE DIH has lost contact with one of its child servers. It allows you to manually take a child server offline for maintenance.

## Disable Index Actions

You can prevent the HPE DIH from forwarding certain index actions to its child servers. For example, you might want to prevent a user from sending a DREINITIAL index action to all child servers of a HPE DIH.

In the [IndexServer] section of the HPE DIH configuration file, set DisallowIndexCommands to a comma-separated list of index actions that you do not want the HPE DIH to forward. For example:

```
[IndexServer]
DisallowedIndexCommands=DREINITIAL,DRECOMPACT
```

If a user sends these index actions to the HPE DIH, it rejects them with a NOT AUTHORIZED error.



## Manage Databases

You can use the following IDOL Server index actions to manage IDOL databases in the child IDOL Servers of your HPE DIH. For more information on these actions and their parameters, refer to the *Distributed Index Handler Reference*.

### Create a New Database in the IDOL Servers

The DRECREATEDBASE index action allows the HPE DIH to create a new database in each of its IDOL Servers. For example, you can create a database to store documents that relate to one particular subject, or to store documents that are relevant to a particular user group. Use the following action syntax:

```
http://DIHhost:IndexPort/DRECREATEDBASE?DREDbName=DatabaseName
```

When you send this action to the HPE DIH instead of to an IDOL Server, note:

- *DIHhost* is the IP address (or name) of the machine on which the HPE DIH is installed, *IndexPort* is the number of the port that you use to send index actions to the HPE DIH, and *DatabaseName* is the name of the database to create.
- This action creates a database with the specified name in each of the child IDOL Servers. Using this action might make the most sense in situations where all the child IDOL Servers are identical.

### Delete a Database and All the Documents that it Contains

The DRREMOVEDBASE action allows the HPE DIH to delete an IDOL database and all the documents it contains. Use the following action syntax:

```
http://DIHhost:IndexPort/DRREMOVEDBASE?DREDbName=DatabaseName
```

When you send this action to the HPE DIH instead of to an IDOL Server, note:

- *DIHhost* is the IP address (or name) of the machine on which the HPE DIH is installed, *IndexPort* is the number of the port that you use to send index actions to the HPE DIH, and *DatabaseName* is the name of the database to remove.
- This action removes the database from every child IDOL Server that has a database of the specified name. If all IDOL Servers are identical, all are treated equally. If the IDOL Servers are not all identical, this action might have unintended consequences.

## Manage Documents

You can use the following IDOL Server index actions to manage IDOL database documents in the child IDOL Servers of your HPE DIH. For complete information on these actions and their parameters, refer to the *Distributed Index Handler Reference*.

## Delete Documents by Reference

The DREDELETEREF index action instructs the HPE DIH to delete one or more documents—specified by reference—from the child IDOL Servers. Use the following action syntax:

```
http://
DIHhost
:
IndexPort
/DREDELETEREF?Docs=DocumentReferences&Field=FieldNames&DREdbName=DatabaseName
```

When you send this action to the HPE DIH instead of to an IDOL Server, note:

- *DIHhost* is the IP address (or name) of the machine on which the HPE DIH is installed, and *IndexPort* is the number of the port that you use to send index actions to the HPE DIH.
- This action deletes documents with the specified references that have the specified fields (if specified) and that are in the specified database (if specified) from all child IDOL Servers of the HPE DIH.

## Delete and Restore Documents by Document ID

The DREDELETEDOC index action instructs the HPE DIH to delete one or more documents—specified by document ID—from the child IDOL Servers. You can also send the DREUNDELETEDOC index action to restore previously deleted documents.

Use the following action syntax for DREDELETEDOC:

```
http://DIHhost:IndexPort/DREDELETEDOC?Docs=DocumentIDs
```

When you send this action to the HPE DIH instead of to an IDOL server, note:

- *DIHhost* is the IP address (or name) of the machine on which the HPE DIH is installed, and *IndexPort* is the number of the port that you use to send index actions to the HPE DIH.
- This action deletes all documents with the specified IDs (or with IDs in the specified range) from all child IDOL Servers of the HPE DIH.

### NOTE:

Because dissimilar documents in different databases can have the same document ID, using document IDs with this action can have unintended consequences.

After you send a DREDELETEDOC index action to the HPE DIH, you can restore some or all of the deleted documents to their IDOL Server databases by sending a DREUNDELETEDOC action. Use the following action syntax for DREUNDELETEDOC:

```
http://DIHhost:IndexPort/DREUNDELETEDOC?Docs=DocumentIDs
```

You can specify the same set of IDs that you used with DREDELETEDOC, or a subset. This index action cannot restore documents if you have run a compact operation (DRECOMPACT) after running DREDELETEDOC.

When you send this action to the HPE DIH instead of to an IDOL Server, note:

- *DIHhost* is the IP address (or name) of the machine on which the HPE DIH is installed, and *IndexPort* is the number of the port that you use to send index actions to the HPE DIH.
- This action restores all documents with the specified IDs (or with IDs in the specified range) to their IDOL Servers (child servers of the HPE DIH).

## Delete All Documents from a Database

The DREDELDBASE action instructs the HPE DIH to delete all documents from a database. Use the following action syntax:

```
http://DIHhost:IndexPort/DREDELDBASE?DREDbName=DatabaseName
```

When you send this action to the HPE DIH instead of to an IDOL Server, note the following points:

- *DIHhost* is the IP address (or name) of the machine on which the HPE DIH is installed, and *IndexPort* is the number of the port that you use to send index actions to the HPE DIH.
- This action deletes all documents from all databases of the specified name in all child IDOL Servers of the HPE DIH. Using this action might make the most sense in situations where all the child IDOL databases are identical.

## Expire Documents

The DREEXPIRE index action instructs the HPE DIH to delete or archive documents that have reached a specified age. You might archive to ensure that the documents in your IDOL servers are current. Use the following action syntax:

```
http://DIHhost:IndexPort/DREEXPIRE?
```

When you send this action to the HPE DIH instead of to an IDOL server, note:

- *DIHhost* is the IP address (or name) of the machine on which the HPE DIH is installed, and *IndexPort* is the number of the port that you use to send index actions to the HPE DIH.
- This action expires all documents that have passed the expiration age on all child IDOL servers of the HPE DIH.

## Change Document Field Values

The DREREPPLACE action instructs the HPE DIH to change the values of fields in its child IDOL Server indexed documents.

**NOTE:**

This action requires a POST request method.

Use the following action syntax:

```
http://DIHhost:IndexPort/DREREPPLACE?Data#DREENDDATA
```

When you send this action to the HPE DIH instead of to an IDOL Server, note:

- *DIHhost* is the IP address (or name) of the machine on which the HPE DIH is installed, and *IndexPort* is the number of the port that you use to send index actions to the HPE DIH.

- Specify documents only by reference, not by document ID. Because dissimilar documents in different databases can have the same document ID, using document IDs with this action can have unintended consequences.

## Change Document Metadata

The DRECHANGEMETA index action instructs the HPE DIH to change the values of the importance rating, database, index date, or expiration date for specific documents in its child IDOL Servers.

Use the following action syntax:

```
http://  
DIHhost  
:IndexPort/DRECHANGEMETA?Type=metadataField&Refs=docReferences&NewValue=value
```

When you send this action to the HPE DIH instead of to an IDOL server, note:

- *DIHhost* is the IP address (or name) of the machine on which the HPE DIH is installed, and *IndexPort* is the number of the port that you use to send index actions to the HPE DIH.
- This action allows you to specify documents by either document reference or document ID. However, unless the child IDOL servers are all identical, you must specify documents by reference only, not by document ID. Because dissimilar documents in different databases can have the same document ID, using document IDs with this action can have unintended consequences.
- This action also allows you to change the database that you assign a document to. If the child IDOL servers do not all have identical databases, this action can have unintended consequences.

# Part II: Appendixes

This section includes the following appendixes:

- [Troubleshooting](#)

# Appendix A: Troubleshooting

This section describes some common issues and their solutions. If your HPE DIH is not functioning correctly, try the remedies described in this appendix.

- **The HPE DIH cannot obtain a valid service port**

If the HPE DIH cannot obtain a valid service port, it displays the following warning:

Warning: Engine *n*. Unable to obtain a valid service port.

To resolve this issue, verify that:

- the HPE DIH IP address has been correctly added to the `QueryClient` setting in the IDOL Server configuration files.
- the IDOL Servers are all version 4.5.0. or later.

- **Actions fail**

If the ACI actions that you send to the HPE DIH fail, verify that:

- the HPE DIH IP address has been correctly added to the `QueryClients` setting in the IDOL Server configuration files.
- the HPE DIH IP address has been correctly added to the `ServiceStatusClients` setting in the IDOL Server configuration files.

- **Index actions fail**

If the index actions that you send to the HPE DIH fail, verify that the HPE DIH IP address has been correctly added to the `IndexClients` setting in the IDOL Server configuration files.

# Glossary

## A

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### **ACI (Autonomy Content Infrastructure)**

A technology layer that automates operations on unstructured information for cross-enterprise applications. ACI enables an automated and compatible business-to-business, peer-to-peer infrastructure. The ACI allows enterprise applications to understand and process content that exists in unstructured formats, such as email, Web pages, Microsoft Office documents, and IBM Notes.

### **ACI Server**

A server component that runs on the Autonomy Content Infrastructure (ACI).

### **ACL (access control list)**

An ACL is metadata associated with a document that defines which users and groups are permitted to access the document.

### **action**

A request sent to an ACI server.

### **active directory**

A domain controller for the Microsoft Windows operating system, which uses LDAP to authenticate users and computers on a network.

### **agent**

A process that searches for information about a specific topic. An administrator can create agents for users or allow users to create their own agents.

### **authentication**

The process of checking user credentials (user names, passwords, and PIN codes) against an IDOL Server or external security repository. The authentication process identifies a user, and allows IDOL Server to confirm their access permissions for different documents.

## C

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### **Category component**

The IDOL Server component that manages categorization and clustering.

### **combinator database**

A DAH virtual database that combines results from several non-identical IDOL Server databases. See also: virtual database, distributor database.

### **Community component**

The IDOL Server component that manages users and communities.

### **connector**

An IDOL component (for example File System Connector) that retrieves information from a local or remote repository (for example, a file system, database, or Web site).

### **Connector Framework Server (CFS)**

Connector Framework Server processes the information that is retrieved by connectors. Connector Framework Server uses KeyView to extract document content and metadata from over 1,000 different file types. When the information has been processed, it is sent to an IDOL Server or Distributed Index Handler (DIH).

### **Content component**

The IDOL Server component that manages the data index and performs most of the

search and retrieval operations from the index.

## D

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### **DAH (Distributed Action Handler)**

DAH distributes actions to multiple copies of IDOL Server or a component. It allows you to use failover, load balancing, or distributed content.

### **database**

An IDOL Server data pool that stores indexed information. The administrator can set up one or more databases, and specify how to feed data to the databases. By default IDOL Server contains the databases Profile, Agent, Activated, Deactivated, News, and Archive.

### **DIH (Distributed Index Handler)**

DIH allows you to efficiently split and index extremely large quantities of data into multiple copies of IDOL Server or the Content component. DIH allows you to create a scalable solution that delivers high performance and high availability. It provides a flexible way to batch, route, and categorize the indexing of internal and external content into IDOL Server.

### **distributor database**

A DAH virtual database that retrieves results from several identical IDOL Server databases. For each query, it retrieves results from only one of the identical copies. See also: virtual database, combinator database.

## F

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### **fetch**

The process of downloading documents from the repository in which they are stored (such as a local folder, Web site, database, Lotus

Domino server, and so on), importing them to IDX format, and indexing them into an IDOL server.

### **fetch task**

A group of settings that instruct a connector how to retrieve data from a repository.

Connectors can run fetch tasks automatically, or in response to an action.

### **field**

Fields define different parts of content in IDOL documents, such as the title, content, and metadata information.

## I

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### **IDOL**

The Intelligent Data Operating Layer (IDOL) Server, which integrates unstructured, semi-structured and structured information from multiple repositories through an understanding of the content. It delivers a real-time environment in which operations across applications and content are automated.

### **IDOL Proxy component**

An IDOL Server component that accepts incoming actions and distributes them to the appropriate subcomponent. IDOL Proxy also performs some maintenance operations to make sure that the subcomponents are running, and to start and stop them when necessary.

### **IDX**

A structured file format that can be indexed into IDOL Server. You can use a connector to import files into this format, or you can manually create IDX files.

### **importing**

After a document has been downloaded from the repository in which it is stored, it is



imported to an IDX or XML file format. This process is called “importing”.

### **index**

The IDOL Server data index contains document content and field information for analysis and retrieval.

### **index action**

An IDOL Server command to index data, or to maintain or manipulate the data index.

### **indexing**

The process of storing data in IDOL Server. You can store data in different field types (index, numeric, and ordinary fields) or prevent IDOL from storing it. It is important to store data in appropriate field types to ensure optimized performance. IDOL Server can return any fields it stores for queries. However, you can query only for terms in Index fields.

### **Intellectual Asset Protection System (IAS)**

An integrated security solution to protect your data. At the front end, authentication checks that users are allowed to access the system that contains the result data. At the back end, entitlement checking and authentication combine to ensure that query results contain only documents that the user is allowed to see, from repositories that the user has permission to access. For more information, refer to the IDOL Document Security Administration Guide.

## **K**

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### **KeyView**

The IDOL component that extracts data, including text, metadata, and subfiles from over 1,000 different file types. KeyView can also convert documents to HTML format for viewing in a Web browser.

## **L**

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### **LDAP**

Lightweight Directory Access Protocol. Applications can use LDAP to retrieve information from a server. LDAP is used for directory services (such as corporate email and telephone directories) and user authentication. See also: active directory, primary domain controller.

### **License Server**

License Server enables you to license and run multiple IDOL solutions. You must have a License Server on a machine with a known, static IP address.

## **M**

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### **mirror mode**

A distribution mode in which DIH distributes to several identical copies of the Content component, for failover or load-balancing.

## **N**

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### **non-mirror mode**

A distribution mode in which DIH distributes the index between several Content components, which all contain a different segment of the index.

## **O**

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### **OmniGroupServer (OGS)**

A server that manages access permissions for your users. It communicates with your repositories and IDOL Server to apply access permissions to documents.

## P

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### **PIN code**

Personal Identification Number security feature used in addition to a user ID and password.

### **primary domain controller**

A server computer in a Microsoft Windows domain that controls various computer resources. See also: active directory, LDAP.

### **privilege**

Role-based capabilities that determine, for example, whether a user is allowed to access specific data.

### **profile**

Information about a user that is based on the concepts in documents that the user reads. Every time a user opens a document, IDOL Server updates their profile. This process allows the administrator to alert users to new content that matches the interests in their profiles.

### **promotions**

Targeted content that you want to display to users but is not included in the search results, such as advertisements.

## Q

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### **QMS rules**

A document stored in the Promotion Agentstore that defines how QMS manages a query. Rules can return promotion documents, modify the original query, or modify the results of a query. See also: Query Manipulation Server (QMS).

### **query**

A string that you submit to IDOL Server, which analyzes the concept of the query and

returns documents that are conceptually similar to it. You can submit queries to IDOL Server to perform several kinds of search, such as natural language, Boolean, bracketed Boolean, and keyword.

### **query cooker**

A JavaScript application that manipulates queries and query results.

### **Query Manipulation Server (QMS)**

An ACI server that manipulates queries and results according to user-defined rules.

## R

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### **reference**

A string that is used to identify a document. This might be a title or a URL, and allows IDOL to identify documents for retrieval, indexing, and deduplication.

### **ReferenceType field**

Fields used to identify documents. At index time IDOL Server can use ReferenceType fields to eliminate duplicate copies of documents. At query time IDOL Server can use ReferenceType to filter results.

### **role**

A set of privileges that the administrator allocates to an IDOL Server user.

## S

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### **security**

Security includes anything that makes sure that only authorized users can access or perform actions on data. It includes making sure that only permitted users can view and retrieve documents, user authentication, and secure communications.

### **suggest**

A type of query that returns documents that contain similar concepts to a particular document, rather than matching a particular query string. See also: query.

## **T**

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### **term**

The basic entity that IDOL Server indexes (for example, a word in a document after IDOL applies stemming to it).

## **V**

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### **View**

An IDOL component that converts files in a repository to HTML formats for viewing in a Web browser.

### **virtual database**

In the DAH, a virtual database controls the mapping between the DAH and specific databases in the child servers. See also: combinator database, distributor database.

## **W**

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### **Wildcard**

A character that stands in for any character or group of characters in a query.

## **X**

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### **XML**

Extensible Markup Language. XML is a language that defines the different attributes of document content in a format that can be read by humans and machines. In IDOL Server, you can index documents in XML format. IDOL Server also returns action responses in XML format.

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